




COOP'S  
SATELLITE  
DIGEST



SEPTEMBER 1981



# APOLLO<sup>TM</sup>X9

## Birth of a legend

National Microtech, Inc. introduces Apollo<sup>TM</sup> X9 Satellite Antenna.

National Microtech, Inc. continues to sell more home satellite antenna systems than anyone in the world. Microtech's new Apollo<sup>TM</sup> is so far advanced over our competition-in features, performance, and cost- that we feel Apollo<sup>TM</sup> is destined to become a legend in the satellite industry. If you are interested in buying or selling Apollo<sup>TM</sup> systems, give us a call today. Remember, no one sells the Apollo<sup>TM</sup> but

Microtech dealers and distributors. See the legend today.



### DEALER PRICES

3 Units	\$1395
10 Units	\$1195
100 Units	\$1095

Optional remote satellite finder \$495 wholesale dealer price.

National Microtech, Inc.

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## COOP'S COMMENT ON TECHNOLOGY

### SCRAMBLING IS COMING - Who Cares!

It now appears to us that HBO and Showtime, and others, who display their products openly without any built-in protection systems, **will scramble**. It also appears to us that HBO et al really are not going to be persuaded by SPACE or anyone else to allow **individual** private terminals to legally access their programming on the present 4 GHz satellites. Motels, condos, apartment buildings and the like, not served by cable TV, should **ultimately** prove to be a different story. We believe SPACE will eventually get this one worked out.

I would fully expect to see scrambling of some HBO and SHOWTIME transmissions concurrent with the switch over to F3R late this year/early next year. And I don't think anybody should panic, or even care, if or rather when they do this. It is their product and they have the right, and it now appears the ability, to protect it anyway they can.

**Two years ago** if HBO et al scrambled, a significant part of what makes private home terminal viewing attractive would have been removed from the private terminal viewing universe. **One year ago** HBO could have scrambled and I for one could have cared less. Some would have felt that their ability to sell private terminals would have slipped a notch however, had it happened at that time.

If you stood in Omaha and watched the motorized antennas on display slip through the orbit belt from bird to bird and if you stopped on each bird and flipped the receiver through the channels available, it only took a few minutes of "scanning" and "tuning" to realize that both HBO and SHOWTIME could disappear, and you would never miss them.

The various premium services feature movies and specials. There are today seven premium services available on four different satellites. They encompass a total of 12 different channels of programming. Losing four of these to view, because **the operators** of these channels **refuse to accept** money from private terminal viewers, is hardly the end of the world.

Of course one could and perhaps should be concerned that if HBO et al do scramble, that other services may follow. I suspect that some will. But, as we have written many times previously, scrambling has its penalties for those who scramble and then use the product. Scrambling, at least any we have seen work, results in degradation of the de-scrambled video. It is not likely that any scrambling technique that solves the degradation problem will be cheap or even reasonable to implement in cost.

**Many people we talked with in Omaha** expressed on-going concern that "unless the legal problems are solved in this industry, we will not have solid growth of the industry". They may be right. Many would-be manufacturers, many would-be home terminal viewers, are not going to spring into action as long as this cloud hangs over us. And that's why I for one will welcome HBO et al scrambling. When they scramble, we will then have a clear explanation to give to nervous buyers. **"You can watch anything that is not scrambled...if they don't want you to watch, they scramble"**. Now that is not 100% true of course, and we accept that fact. Many who will not jump into scrambling **also** do not want you watching. But with HBO et al going to scrambling, that will at least prove that scrambling can be done and it will reduce the temptation of a heavily lobbied Congress to create legislation that allows monster fines to be levied against those who watch unauthorized channels. I do not see how a law can be lobbied into position that creates fines and jail terms for people who watch channels that are not scrambled, when it has been proven that scrambling can work and will work for those who **really care** what happens to their services out in the field.

So when HBO starts to scramble, I think we should all sit down and send them a telegram thanking them for having the guts to go ahead with it. They are to be congratulated for making it far easier for us to explain to would be customers just what the status of the various on-bird program channels is, and they are to be thanked for giving us the ammunition we may well need to defeat (through SPACE) the legislation that is sure to be proposed in the coming 12 months or so.

A number of legislators, such as Congressman Charles Rose of North Carolina, understand this issue very well. Most however do not. It is important that if you know, or can get into see your own legislator, that you explain to him or her what this business is all about. We like Rose's posture that if they (meaning the programmers) are **really** concerned about unauthorized viewing, they will take technical steps to stop it, i.e. scramble. That sounds good today, but the retort in the past has always been that scrambling costs too much money. HBO (bless their hearts), when they start scrambling, will prove that to be untrue. We would naturally expect you to respond when you hear this over worked retort **"Why, then, if it is so expensive, does HBO (et al) do it?"**.

So we welcome HBO and their scrambling. They should have done it sooner, but we understand the reasons why they have not. Now perhaps, with **some** scrambling up there, we can move ahead and resolve this dumb "piracy" issue.

CSD  
TECHNOLOGY



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## SPTS '81 OMAHA LIKE NO SPTS EVER BEFORE!

### Pigs In Omaha

There is a line in the song/movie "Convoy" which asks the question "Don't they have pigs in Omaha???". An estimated crowd of 1200 satellite television "crazies" (with full credit to Annie Howard) ignored the best efforts of PATCO to shut down the Omaha airport, and those heading to the meat packing capitol, over the weekend of August 14-16. They showed up and if there are pigs in Omaha, all 1200 were far too busy to even notice.

Each SPTS/SBOC event has had a unique and different flavor. Each has made some substantial contribution to the growth of our industry in just two short (or long, depending upon your viewpoint) years. Omaha will be remembered for antenna tests (there were some "pigs" in that one!) and the blossoming of the dealer / distributor system that has sprung up in the home satellite terminal industry. Omaha will be remembered for the non-stop television coverage, within the Holiday Inn facility, that seemed to follow attendees wherever they went. Omaha will be remembered for things that worked very well, and things that didn't work so very well. Omaha was a classic SPTS.

**Omaha was an "order show"**. John Ramsey of Sat-Tec, appearing on the morning "Today at SPTS" television show, observed **"This reminds me of Miami (the second SPTS) where people came up and placed hard orders for 25, 50 and 100 (receiver) units at a time"**. Steve Bland of Hoosier Electronics wasn't in the industry in Miami. He will remember Omaha because his near-exclusive offering of a brand new R. L. Drake Company satellite receiver clipped along averaging one complete dealer system demo package sale every five minutes for three solid exhibit days. Exhibitors had a great show. They sold (we estimate) in excess of \$20,000,000 in equipment (with deliveries scheduled over the next twelve months). And based upon our own industry monitoring system which pegs manufacturer sales to distributors and dealers at a monthly rate of \$6,800,000, at the present time, that tells us that over the next 12 months approximately 23% of the gear that will be shipped was sold directly to dealers at the Omaha show. Of course the industry will continue to grow at a fantastic rate (we now chart it at 225% per year and going up monthly), so at the end of the next 12 months the Omaha sales percentage will slip rapidly as a percentage of **all gear shipped**, but the numbers are very impressive none the less.

**There were many dangers lurking at Omaha.** This is being prepared at Arcadia the evening of August 16th; we fought the PATCO mess to hurry back to Oklahoma several hours prior to the official close of SPTS Omaha to get this



### SAYS IT ALL.

report prepared for the September Digest. We didn't "shake" loose of the last SPTS attendee until we hit the ground at Oklahoma City and headed to Arcadia. The Omaha airport was filled with familiar faces. Less than an hour later in Kansas City we were still running into familiar faces. And on the last leg, back to Oklahoma, a few were on the airplane with us. Heading to Arcadia we learned about a scary pyramid plot



**WINEGARD at work.** Winegard's entry into marketplace is slow and deliberate, concentrating on professional quality gear for MATV installations at the present time. Their trailer mounted antenna is by Prodelin.

### OUR COVER -

SPTS '81 Omaha. You almost had to be there to believe it. The world's largest single display of satellite television receiving antennas (51 in all) and associated electronics. The home satellite viewing world will never be the same!



one new dealer had been sucked into; he was set up as a "dealer" by a chap who claimed to be a wide region distributor for a large national marketing outfit. The new dealer bought a package of gear, a demo rig and system, to get started and had been shown a pricing schedule on the national marketing firm's letterhead. He discovered after spending \$5800 for a demo system that the chap he bought it from was (1) **not** a distributor at all, but merely a dealer himself, and (2) had he dealt with a real distributor he would have saved \$1800. Our traveling companion agonized about being taken in so easily. Another fellow-captive of PATCO told us about his plans to bring live American satellite television to a small country on the northern coast of South America. He was "worried" after attending three days of lectures that a 12 foot dish would do it! We assured him it would **not** get him pictures and he showed us a handwritten "guarantee" from an equipment seller that was **not** exhibiting at Omaha assuring him that the \$8900 (!) package, "wholesale" of course, would produce "perfect pictures". I set him straight on that one and then wondered what **we** did wrong if he sat through **three** days of lectures and videotape presentations and **still** came away believing that such a system **might** work at a 2 degree (!) look angle.

While awaiting a connecting flight in Kansas City we were approached by another attendee who is involved in the ownership chain of a newspaper/radio-television station(s) firm. He was investigating the feasibility of establishing a regional electronic video newspaper service, to serve small, rural newspapers in a several state area, using a satellite



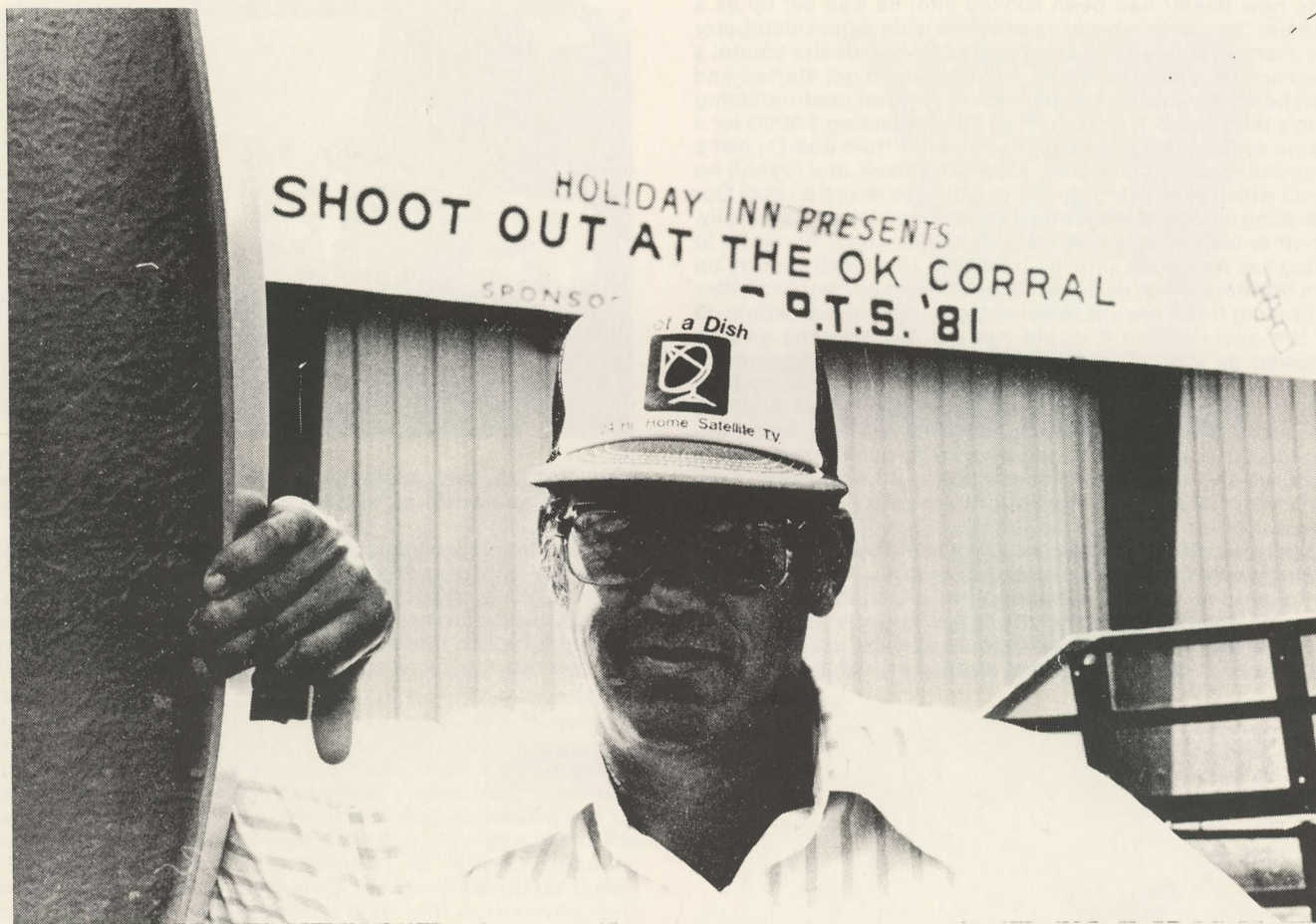
**YOU HAD to turn sideways to walk through in some places. Each antenna had a 20 foot area assigned to it.**

transponder. He commented that to purchase a 15,000 subscriber newspaper these days would set his firm back around \$6,000,000. He felt strongly, after attending Omaha, that that same money would be better spent to establish a video production center to create a combination of alpha-numeric news service and live, regional news, sports and



**A LEGEND ON A MOUNT - National Microtech's Apollo X9 antenna dominates their four booth display. The firm continues to grow rapidly and the X9 is one reason why.**





**SAYS IT ALL NUMBER TWO - Butch Harper, Holiday Inn owner and an admitted satellite crazy prepared and hung the banner above the antenna field. This chap from Hays, Kansas said he got into satellite terminal sales a few months ago, has sold several systems and likes it much better than the concrete and masonry field!**

weather coverage, and then use the satellite to link the service to several dozen newspapers. The hottest thing going in the newspaper game these days is to rent or lease a channel on the local cable TV system. The newspaper then



**MEASURE THE FOCAL POINT - Hayden McCullough and crew re-check the focal point distance on Spherical antenna. Hayden made a six footer play.**

programs the channel with local and regional news, using alpha numeric display typically, and selling local advertising "time" around the local news service. He commented that a 2,500 subscriber cable system could create annual "profits" in excess of \$50,000 per year for a newspaper fed system like this. No wonder he was looking at renting a transponder to reach several **dozen** such systems, and tying them all together!

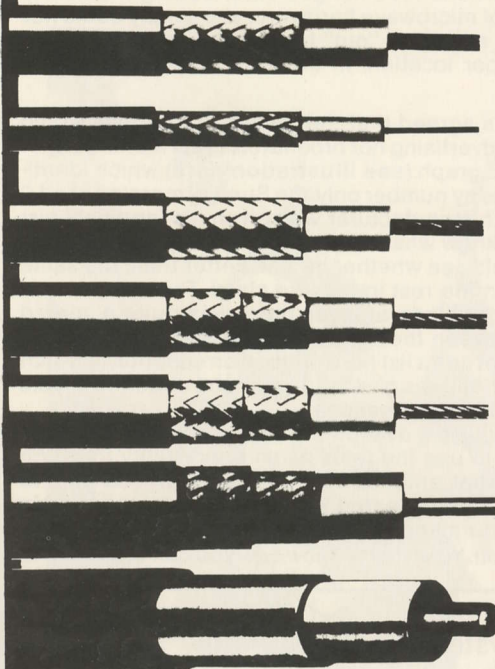
There was a high percentage of new or almost new dealers attending Omaha. The "Back To Basics" theme seems, on reflection, well chosen. Most attendees acted like this was a good format and it is likely to be repeated at the next **summer** SPTS show in 1982. Steve Gibson was superb with his lead off session on antennas and how they interface with the balance of the system. We'll see shortly that antennas were a big topic through the Seminar. Following Gibson, Bob Luly addressed LNAs and why they (and the feed) have to be carefully chosen, installed and maintained. Luly would later get the "popular nomination" for having the most innovative new product shown in Omaha and we'll see what that is all about shortly, also. Wrapping up day one David Barker explained why receivers are different, why some work better than others and why some are just plain bad buys.

**We experimented** with a new concept (for SPTS), in Omaha. We ran a **pair** of television channels (actually, **we** operated channel 2 while **Hero Communications** provided the equipment and manpower to run channel 9) and used the channel 9 outlet to feed live coverage of some sessions and



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RG 213/U	19.0 DB	28.0 DB	.285/ft.	.271/ft.
RG 214/U-S	19.0 DB	28.0 DB	1.45/ft.	1.37/ft.
RG 214/U-T	19.0 DB	28.0 DB	.66/ft.	.59/ft.
RG 217/U	13.0 DB	19.0 DB	.64/ft.	.60/ft.
RG 331/U	6.5 DB	9.00 DB	.50/ft.*	.41/ft.

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lots of floor and antenna-lot activity directly into the rooms. We had our rough spots, mostly due to the unpredictable nature of an "in-house" MATV system which, while not the worst we have run into, was certainly not the best either. The concept can be made to work, and we'll be modifying it for improvement and really give it a work out at the **Anaheim Satellite Video Show** (SVS '81) this coming November 20-22 in California. There was one very positive aspect to the Omaha "experiment"; the owner of the Holiday Inn, a chap named Butch Harper who has his own at-home terminal as well as one at the Inn, watched us at work and then promised that if we ever return to Omaha we will find each and every meeting, lecture and display room in the facility wired so that we (or any other group) can plug in a hot TV camera and audio sub-system, and automatically be connected to a high quality VHF modulator so that instant transmission of the events will appear in every room in the facility. Harper is convinced that satellite tele conferencing and live television coverage of meetings is the wave of the future, and being a pretty innovative chap he wants his facility to be one of the first to be so wired up.

**Antennas.** Ah yes. Well, we said that we were going to have an antenna testing program in Omaha and by golly we did. The precise and exact explanation of how we arranged to conduct the tests will appear in the October **CSD**. Here, basically, is how it worked:

- 1) Any antenna manufacturer with a **parabolic** could have his antenna measured by test coordinators Jack Trollman and Mike Gustafson; provided a test fixture could be physically inserted into the focal point feed (or Cassegrain feed), between the flange on the feed antenna and the mating flange on the LNA.
- 2) The "fixture" was a method of inserting broadband "noise", via a highly calibrated attenuator system, into and on top of the received signal.
- 3) All antennas measured were peaked up on transponder 24, F1, and the carrier level (as in Carrier to Noise Ratio) was computed.

4) By noting how much noise it took to cover up the signal present, on a power meter device, the actual received carrier level was thereby computed.

**There were 51 antennas** set up and operating at the peak of the antenna activity in Omaha. That surpasses, by perhaps 18 or so, the best former "antenna record" for an SPTS. We also lay claim to having had the largest single display of TVRO antennas ever assembled in one spot, at one time, in the world, for the Omaha SPTS. It took no less than 4 to 5 hours to walk through **just** the antenna "field" and carefully study each antenna there!

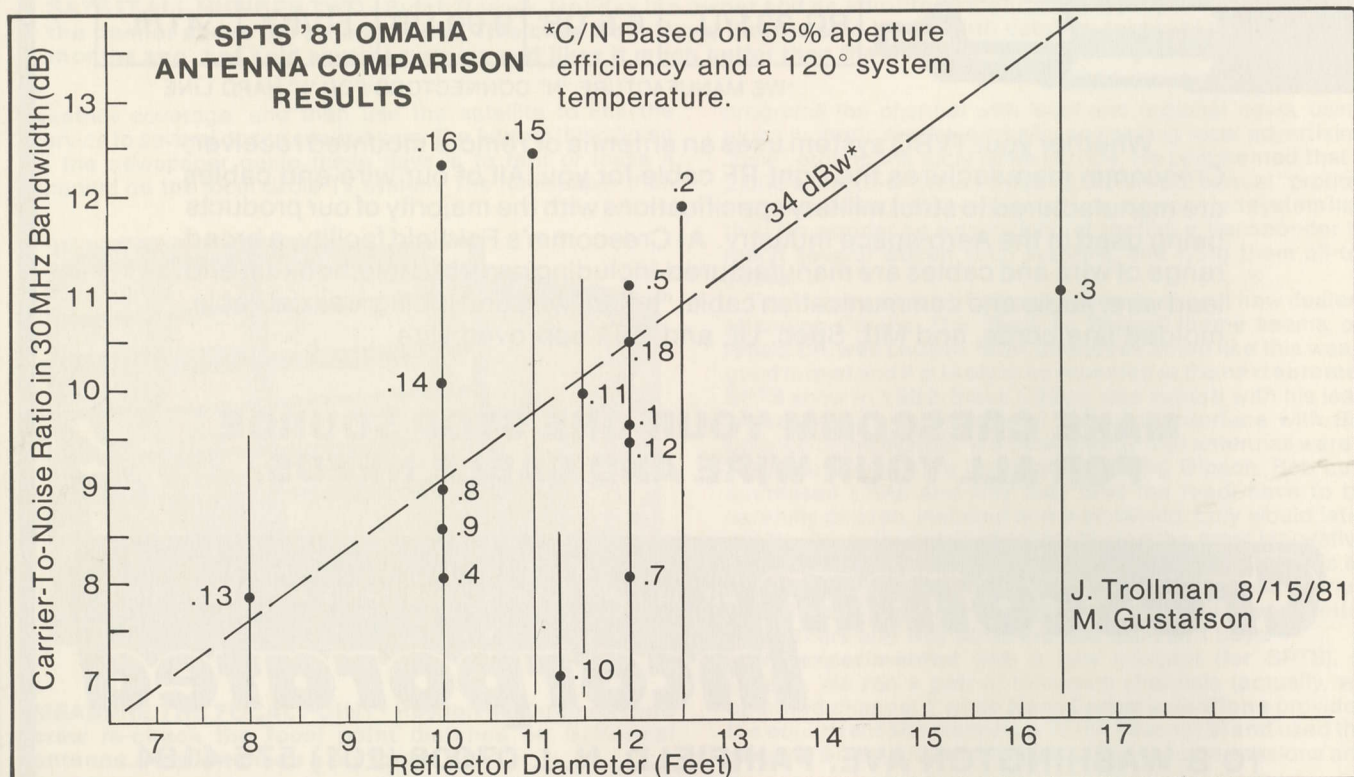
Of the 51, we could not measure Spherical designs. That left about 10% of those on hand out of the competition. Then there were another 20 plus that lacked the physical room to allow the insertion of the test jig/noise insertion contraption between the LNA and feed flanges. After adding the nearly foot long piece of microwave hardware, you simply could not push the whole assembly "out" far enough to re-focus the feed in the proper location. In the end 16 antennas were checked.

All participants agreed that the results of the tests would **not** be used in advertising nor brochures. Each manufacturer was plotted on a graph (**see illustration here**) which identified the antennas by number only. On Sunday morning at a 10 AM session each manufacturer was given his (and only his) test results. He knew what **his** number was and by looking at the chart he could see whether he was better than, the same as or worse than the rest in his size class. The chart shows that in the 10 foot class, at least, there was quite a spread (about 4 dB) between the worst, and the best checked.

**No**, you will **not** see a list here of who corresponds to which number. No such list was given out in Omaha either. The tests were conducted for two reasons:

- 1) The manufacturers asked for them, and wanted them;
- 2) We wanted to use the tests as an opportunity to **teach** attendees what antenna testing was all about, and, to show what we anticipated would be a wide variation in antenna performance.

Yes, we hear you. **You** want to know how **you** can use this data





to narrow down your **own** selection of an antenna line to handle as a dealer. Here is what you have to do. Remember, only 16 antennas were tested. More were not, for the reasons stated, than were. You ask your favorite supplier if his antenna was tested. Then you ask him what his "test number" is, on the chart appearing here. He'll give you that number and you then can see how his antenna stacked up against the rest tested, in his size and in other nearby sizes.

**This will not satisfy everyone.** We know that. We'll explain all of our reasons for doing it this way in the October **Digest**. They are good reasons, we feel.

Now, how good was the testing procedure (and therefore, the results shown)? As Taylor Howard, who oversaw the full program, told the Sunday morning audience **"These tests reveal the performance of a specific antenna at a specific location at a specific point in time"**. In other words, take the



**HURRY UP - supplier gets the final bolts in place to mount LNA plus feed to dish antenna prior to start of seminar.**

same antenna to another location, boresight it on the bird, and it could work differently. Every time you put one up, tweak it, and turn it on, you can expect different performance, with many of the antennas available.

How valid, even given this understanding, were the testing procedures? Nothing is beyond argument. The technique is one utilized for microwave and other antenna applications worldwide. It has the ability to be within a  $\pm 0.2$  dB or so accuracy "window" if conducted over a period of time (i.e. again and again), with the same antenna. We tested each antenna **once**. So we lost (because of the pressure of having to move on to the next antenna) the benefits of "averaging" several discrete tests on each antenna, spread over time. We did use a four meter antenna provided by Doug's, Inc. (USS)

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## Components

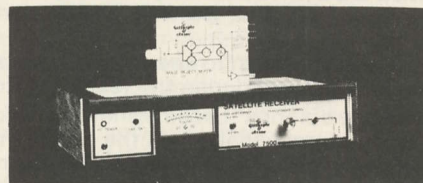
MICROWAVE CHIP CAPACITORS VITRAMON Vee Jem 7800 series for bypass/coupling  
7800P7G08 1.1-1.7GHz 7800P7G04 1.3-2.6GHz 7800P7G01 2.6-4.2GHz  
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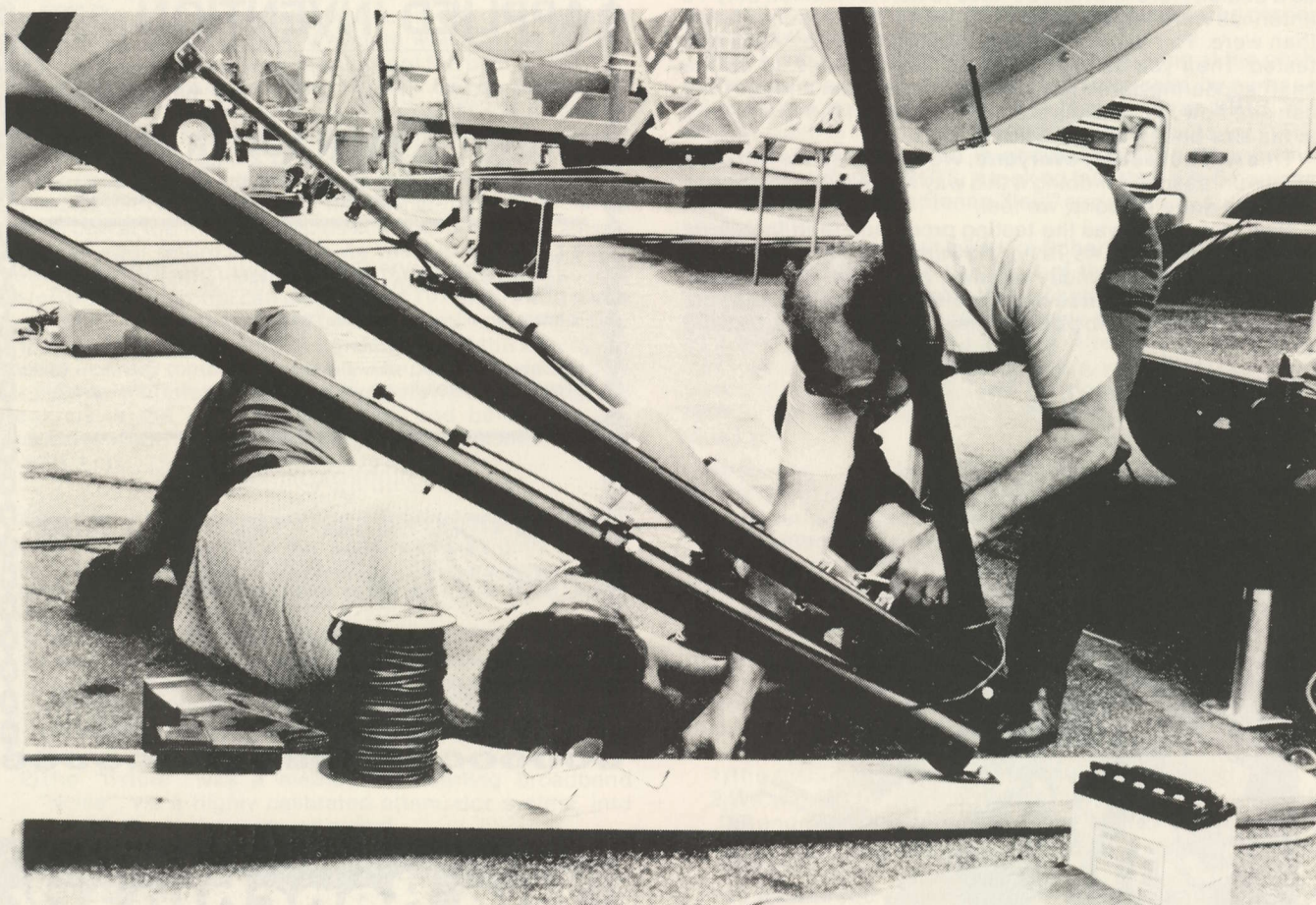
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Get the Last Word **First**





**DARNED BOLT!** He probably did not plan to spend an afternoon laying on the asphalt paved parking lot in what was once a business suit. Oh well, it's all part of the game!

as a "reference antenna" to keep tabs on the stability of the transponder 24 signal during the testing period (two days). This "reference antenna" became, then, a way to calibrate the short and long term variations in the transponder 24 signal during the testing period. Just in case you are interested, this transponder rose up and dropped down, slowly, over a 1 dB "window" during the testing period.

The technique and "calibration procedure" aside, we did discover, **after** the testing was completed, that there **may have been** some terrestrial signals leaking into the Holiday Inn parking lot. A crew, led by Steve Gibson, hauled an antenna feed, LNA and 4 GHz spectrum analyzer out into the parking lot between 2 and 4 AM Sunday morning to see what terrestrial interference might be leaking and sneaking around. Some antennas had seen it at certain of the antenna locations on WESTAR I and III and COMSTAR D2 (D1) headings. Nobody reported it on the FI heading however, and that is where our test transponder was. Gibson and Chris Shultheiss of SATCOM Canada found identifiable terrestrial interference over the range of transponders 1 and 21, on F1, at several spots checked with the analyzer. The nasty terrestrial signals were not of high level, were **not** on 24 (at least not between 2 and 4 AM in the morning), but they were bouncing off the Holiday Inn super structure and landing on the antenna "field".

Could some terrestrial signals have leaked into the feeds on any of those antennas tested, on TR 24 during the daytime testing hours, and caused some erroneous test results? **It is possible.** How might that effect the results? One would

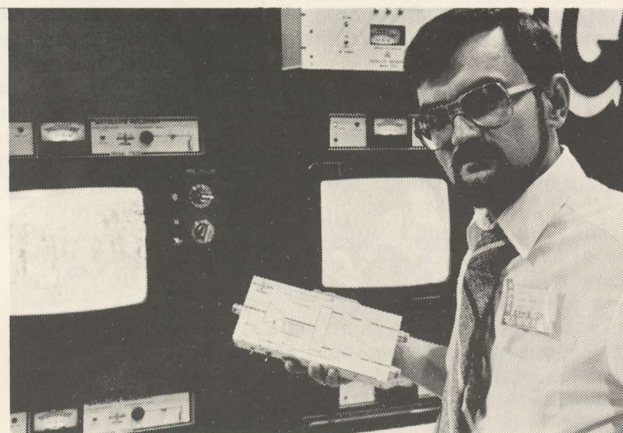
**assume** that the terrestrial interference **might** have added its signal level to the F1 TR 24 signal level and thereby have raised the apparent power-meter measured "carrier level" on an antenna infected by some interference. **Might is the operative word here.** We simply do **not** know, and even if we had discovered the presence of low level terrestrial signals prior to the testing, other more localized problems (such as the ever present LO radiation from single conversion receivers) would still have overshadowed the terrestrial signal sources.

So how much confidence can anyone put into the test results? We suggest it would be wise to use the results, as you talk with manufacturers who did participate, as a "guide" only. Any supplier who says "Our antenna was best" or "Their antenna was worst" is reaching, we believe, into an area of great uncertainty. As the literature handed out at Omaha stated **'No antenna will be best and no antenna will be worst'**. We believe that to be the case and we also hope that nobody tries to make any more of the testing program than that. The bottom line? We all learned a lot, and as several of the antenna suppliers said to us after the results were known **"Let's do it again in Anaheim!"**. Well, we'll do it again. But probably not in Anaheim.

We mentioned single conversion receiver radiation problems. In spite of the 51 antennas jammed into 20' by 20' squares on a paved parking lot, we averaged fewer problems this time than in Washington. Oh yes, we had problems all right. As Taylor Howard noted **"Now somebody has placed Scan Tune on single conversion receivers and when they**



demonstrate the scanning feature the LO slides up the band from bottom to top and then starts over; rather than sitting there in one place and wiping out a single channel for others around it. The damn thing acts like a radar sliding all over the place!". I honestly think some of the manufacturers are working very hard on solving this one and things will get better. Perhaps even before the FCC jumps on us with both feet and forces us to clean up our act. In that department, our hat is off to Norman Gillaspie and crew for developing their AmpliSplitter® system for their single conversion receivers; a step in the right direction. And to Andy Hatfield at AVCOM for doing a **complete** job on his LO with isolators. Others are working on the problem and we feel sure that by the time we get to Anaheim we'll see some definite reductions in LO levels. We are considering taking a spectrum analyzer, and LNA plus horn, and "sniffing" each single conversion receiver and the antenna it is connected to, in Anaheim, and then **announcing** the results. If we do this, **or are forced to do it** by manufacturers **not** taking steps to clean up their receiver acts, you can be sure **this list** will have full identification of each receiver "sniffed"!



**CURE for single conversion problems; Werner Vavken holds up Gillaspie & Associates AmpliSplitter® box. We are looking forward to testing a new 5000 series Gillaspie receiver in the islands and will have a report for you.**

One of the all too common problems we heard from dealers dealt with their (reported) problems with manufacturers who were not responsive to service problems. One double conversion receiver apparently has had some problems with thermal (heat) drift. Several dealers for it, in Kentucky and surrounding states, were close to irate in reporting how difficult it was getting the problem corrected on those units affected. We conveyed their feelings to their manufacturer. Others were high on their praise for quick turn around and responsive concern from their manufacturers. Earth Terminals, Inc., in particular, got high dealer praise in this regard. Our suggestion is that **before** you take on a receiver line, find out the name of a few "established dealers". Call them on the telephone and get a feeling for how they rate the supplier. A broken receiver tied up for sixty days for a signal level meter repair won't do your cash flow any good!

The stellar nominee for the most innovative and in many ways exciting new product on hand was Bob Luly's "Electronically Variable (+/- 90) Polarizer-Transition". The product also gets our award for being the most over-named device on hand (!). We decided to call it the "**Luly Polarizer**" and hope that catches on since the "other name" takes up too much space to print and too long to say. Here is what it does. You insert it between your feed and your LNA. It bolts onto the LNA flange and you in turn bolt the feed to it. It is just a couple of inches thick, and for most antennas you should be able to

## LNA Breakthrough

Off shelf delivery on Amplica LNAs—wholesale dealer prices

120°—\$595 105°—\$795  
110°— 695 100°— 895

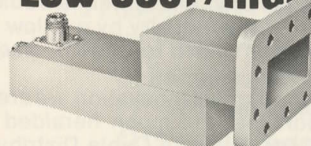
(All feature through the line power, full data sheets.)

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**50 dB Gain**

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slide the LNA/feed/Luly Polarizer "back" (away from the dish), the same distance as the depth of the Luly Polarizer, and re-focus the feed. Now you send voltage to the Luly Polarizer. If you send a fixed voltage (15 VDC), each time you apply the voltage there is a (speed of light) switch from one polarization to the opposite polarization. Or, if you want to fine tune (as in tweek) your polarization "match", for different bird headings, you rotate on a pot control and the Luly Polarizer tracks (with the same "speed of light") from where you were before you touched the pot to where you want to be when you stop turning the pot. Infinite, speed of light, rotation and adjustment of the polarization.

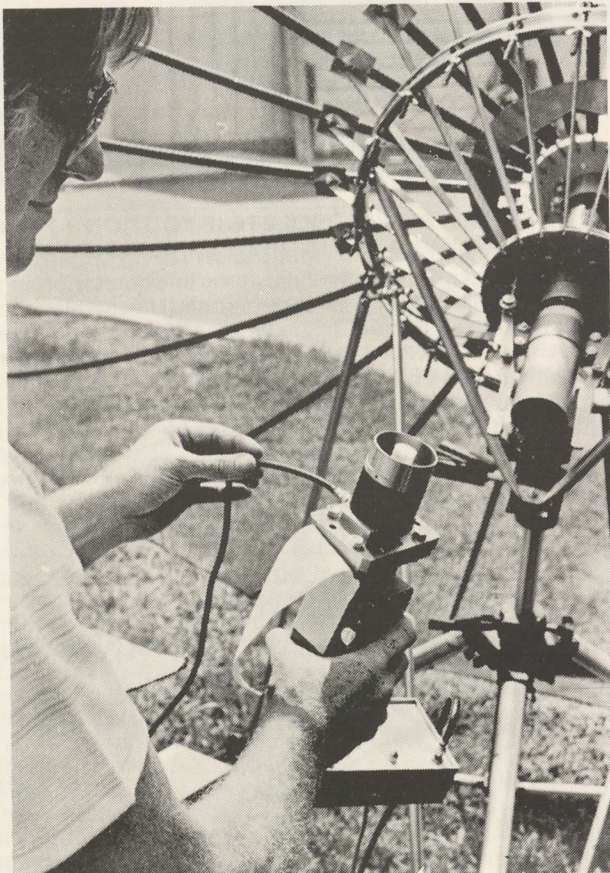
**Nobody**, to the best of our knowledge, in **any** area of satellite communications, has ever made something like this work before. The commercial boys, including those at IN-TELSAT, S-A, Microdyne and so on, should love this one. So did attendees at SPTS Omaha. We heard of two firms that placed hard orders totalling more than 1,000 units at the show, on the spot! If that was not a sufficient reason for Bob and Jan Luly to head home feeling pretty good, the top performance of their new "mesh Umbrella" antenna would be. An outstanding contribution to the industry by a fellow who proves once again that you don't have to be RCA-sized to invent a brand new wheel.

If the Luly Polarizer was the highest innovation, we are sad but honest enough to report that the much heralded and perhaps over promoted **SCDN** (Satellite Cable Distribution Network) package was the biggest disappointment. It was

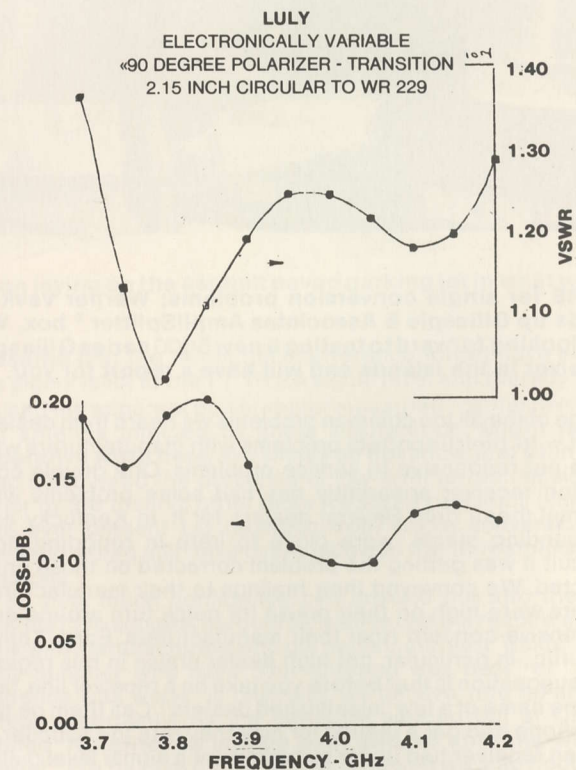
also the most dramatic innovation on hand. It will change the way many aspects of our business function, in the coming years.

The August issue of **CSD** addressed the SCDN terminal by noting that here was a package that would allow two or more receivers to be connected to the same TVRO antenna and each receiver would have independent access to each of the transponders on the bird "addressed" by the terminal. This is accomplished by parking the LNA / feed system polarization between horizontal and vertical, down converting the full 3.7 to 4.2 GHz band down to a region covering (roughly) 450-950 MHz and then distributing the mixed or combined vertical and horizontal signals to as many receivers as wish to be connected to the antenna, through 75 ohm (CATV type) distribution cable. Using cable TV or master antenna TV "type" line amplifiers, the full 500 MHz wide band can be shared almost infinitely by numerous receivers. **Any** receiver location can tune in **any** transponder (vertical or horizontal) at **any** time without having **any** effect on other receivers connected to the system.

The people who showed off the system are SatFinder Systems of Tulsa, Oklahoma. **And there were first-time-showing problems.** The system was not placed on display

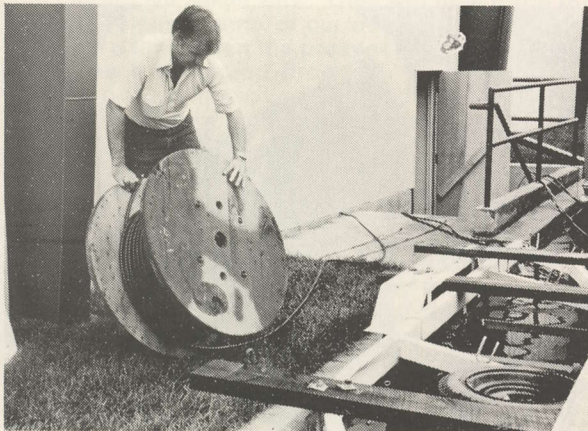


**LULY'S POLARIZER** - the circular device sitting atop the LNA inserts into the waveguide on the back of his now almost-transparent Umbrella antenna (in background - it is there!) to do magic things to signals passing through the system.



**LULY POLARIZER** - this graph displays the measured insertion loss (or signal loss) created by the polarizer when it is inserted into the waveguide between the feed horn and the LNA. Bob Luly reports this loss (from 0.1 to 0.2 dB) will end up in the 0.15 dB region on units shipped.





**NOT A ONE MAN JOB** - supplier man-handles spool of larger Heliac cable to get it run from his antenna location to his booth.

until the second day of Omaha's show. Before the system was turned on, in the SatFinder booth, David MacZura and Larry James of the firm held an "information conference" which we estimate 800 or so attended. There they said the following:

- 1) **The system was operable** but not up to the standards they would demand before shipment.
- 2) **One of the "trade offs"** required, if the user demanded all 24 transponders simultaneously, is that you must go up by 2 dB in antenna size to maintain both vertical and horizontal transponders at high quality levels. For example, if a 10 footer is now required to produce perfect pictures at a site, and, you want simultaneous reception from vertical and horizontal with the SCDN terminal at the same site, you need to go to a 13 foot antenna. Is this always going to be a requirement? "No" said MacZura "but for now it is".
- 3) **The present system** offered to the industry uses a standard LNA followed by the SCDN downconverter. The next generation will marry the LNA and the down converter into a single package.
- 4) **The present** down converter has a price of \$275.
- 5) At each receiving location (i.e. viewing spot) you must "interrogate" the combined vertical and horizontal sig-



**HOWARD AND JUNIOR COOP** - Taylor Howard and Kevin Cooper begin an inspection of one of the three long aisles that sheltered the largest gathering of satellite hardware ever assembled in one place.

## GENUINE HOWARD TERMINAL PC CARDS

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- (B) 70 MHz IF and Filter - \$25.00
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**SCDN ON DISPLAY**- Royden Freeland (ICM), left and Taylor Howard (center) join SatFinder's David MacZura (right) to inspect the reception from the "wireless satellite TV receiver system" on display in the SatFinder booth.

nals with a **special** SCDN receiver/demodulator/converter. These are called "slave" receivers, since the "master" receiver is considered to be the down converter. Three versions were discussed; a do-everything consumer package that has digital tuning and display and a \$950 price tag, a detent tuned version that has a \$800 price tag, and an "export market only" version that has a built-in black and white video screen (and accompanying audio). The later version will sell for **less than** the digital or detent versions but the pricing was not given out.

Larry James said that a strict "first in/first out" policy would be followed for processing of orders. We witnessed some very sizeable orders being placed at Omaha. A \$200 deposit per receiver is required and delivery is anticipated as being in 90 to 120 days.

**In the display booth**, an "export only" through-the-air system was on display. You could pick up the small portable receiver and with its built in batteries wander about the exhibit hall watching and tuning in satellite television.

**Arrangements to demonstrate** the system on a dish larger than the standard SatFinder ten foot fell through at the last moment, Saturday morning, and they were forced to show it off to the anxious attendees on their **ten foot** terminals. The pictures were not superb. By Sunday morning two things had been corrected; they got the system operating on a 13 foot terminal, and, discovered much to their dismay that an RCA monitor which they have been using to demonstrate the system had a defective vertical linearity circuit. This had caused some "pulling" of the video on the screen and

distortion in the pictures.

**We said the unveiling of the SCDN terminal was a disappointment.** This was because of technical problems associated with the carnival like atmosphere at the show proper. What really would have changed many people's **first** impressions of the system would have been the luxury of another 24 working hours to get the system properly installed and operating **before** anyone saw it. Those who saw it Sunday were far more impressed than those who saw it Saturday.

We heard from several other receiver designers who witnessed the announcement and break through. Some were confused, a few were angry. The confused ones said things like **"I can do the same thing by parking the feed in between vertical and horizontal; I can show you both sets of video!"** When it was pointed out that the SCDN slave receiver showed both sets **without interference** between the two, while their "technique" had both vertical and horizontal "mixed together" on the screen at the same time, they responded "that is just a matter of making the IF narrower, say 20 MHz". I am not sure any of those designers really did understand what was being done, since narrowing up the IF is **not** how SCDN does it, nor is it the answer since you end up with the modulation products or sidebands of the opposite polarization signals still in your passband when you do this. Two receiver manufacturers confided that they were working on a similar ("...but much better...") system. One said he was mostly angry that the SCDN terminal was put on display in an

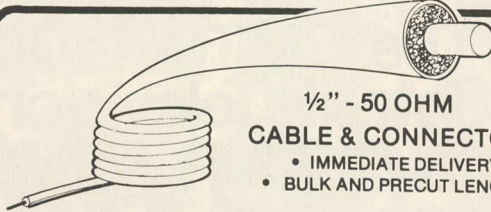


"imperfect form". We asked why. "They will now force the rest of us to release some of our own next generation equipment at a time when the present generation is just starting to be a perfected product". This person was saying that too much innovation, released too soon, keeps everyone designing new product rather than allowing existing product to be perfected. He had a point.

The biggest question mark? SPACE. We put a special session for SPACE on the program mid-day Saturday. Present Prexy Taylor Howard and General Counsel Rick Brown appeared and explained the status of various pieces of legislation and areas of concern the FCC has with the industry. The bottom line was that nobody knows anymore today, about the future legal position of this industry, than they knew when we were all last gathering at Washington, D.C. We are happy to report that many of SPACE's internal operational problems seem to have been worked out at Omaha.

If there was one area of legitimate concern by attendees, it was the fears that many have about equipment operational performance. One fellow told us "I have enough badly designed, poorly operating antennas and receivers stored in my warehouse to start a museum!". He went on to explain that the new dealer, not sophisticated in the ways of microwave television, gets sucked into ordering equipment which either is not properly designed or would not work "in his area of the world" even if it was operating properly. "The gear does work, after a fashion" we were told "so we have a difficult time building a case for returning it for a refund. We get stuck with it!". There is mounting support for an industry supported testing laboratory which would "certify" the exact operating parameters of items offered for sale. SPACE, however, seems to continue ducking this issue so lacking interest on the part of the industry-trade association nothing is happening in this area, in spite of the real need for some type of certification and check out clearing house. One manufacturer is convinced such a system would never work. "I bought ten antennas from a firm that displayed in Washington" he related. "The unit they had in Washington looked good and worked great. I felt we had made a decision to use a very high quality fiberglass dish for our local installations. When we received the ten units they were no where near the quality of the unit we saw on display and operating in Washington. In fact they were so bad that we cannot use them at all. Anyone want to take ten badly warped dishes off our hands?". The message here is that probably any firm can build one really good quality version of their product but that quality may not be duplicated in production. "What happens if they get a certification for their high quality product version and then start shipping lower grade junk; what good would certification be in that case?". A good question.

There were several exciting innovations in antennas. Microwave General has gone to stamped metal panels for its high grade antenna line to insure that the parabolic curve is found throughout the surface of the petals. That's good but it is not a cheap way to do it. They also feature a Cassegrain fed antenna line and we heard plenty of discussion about the "next generation" of antennas on the floor. By the time we get to Anaheim we expect to see foam or fiber-foam antennas constructed in a closed mold configuration. A few of these will be Cassegrain fed since that is one way to pick up another dB or so of gain, without increasing the antenna size. Many will, we suspect, use the Luly Polarizer for shifting vertical and horizontal. The result will be lighter weight, stronger antennas with much better control of surface accuracy and therefore higher gain and better control of sidelobes, plus better control of "as installed" antenna accuracy. CommPlus (now SATCOM of Canada) displayed a new tooling system for their 12/15 foot metal structure/mesh surface antenna and in the non-fiber area that approach will also result in far better surface accuracies. We haven't seen all of the innovation in antennas yet!



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The ICM TV-4400 offers advanced receiving techniques that improves satellite TV reception. The "system" consists of two units. The smaller of the two is the RF downconverter which is enclosed in a environmental protective box (3" x 4" x 7"). The double conversion RF downconverter is intended to be mounted at the antenna site as close as possible to the LNA. The advantage . . . cable losses at the high frequency are negligible.

The baseband receiver unit (3 1/2" x 8" x 8") has 6.2 or 6.8 MHz audio selector switch, channel step tuning selector, fine tuning, power switch, all on front panel.

Features include: Automatic frequency control, automatic gain control, standard video output, subcarrier output for future accessories, wideband phase lock loop demodulator, internal selectable video polarity, internal audio and video controls, provisions for RF modulator. Receiver is equipped with a standard jack for optional remote control.

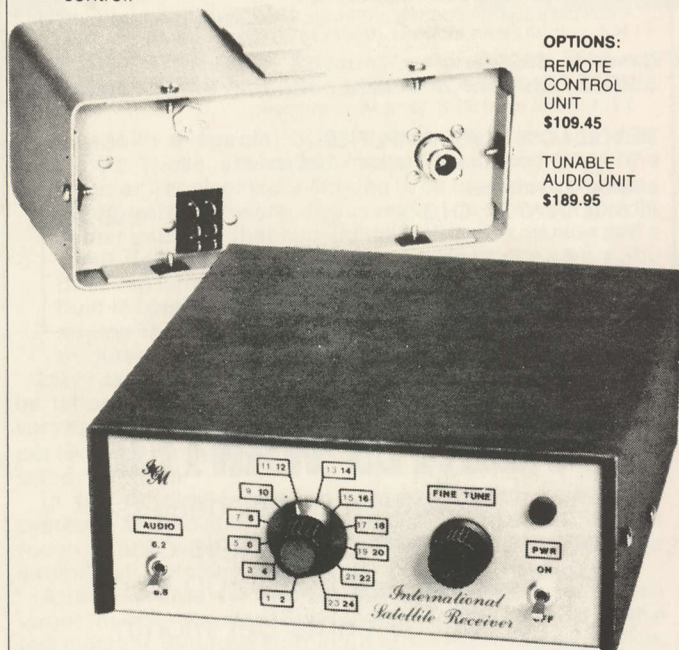
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### OPTIONS:

REMOTE  
CONTROL  
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\$189.95



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**Our award** for the most advanced pre-production antenna unit on display would have to go to KLM. They showed a very nifty remote controlled antenna mount and drive system using Az-El technology. The display control features fulltime read out of the antenna position and switch selection of preset satellite locations. What impressed us most was the elaborate care the on-display unit showed for protection from the outdoor elements. Rubber boots to cover and protect wiring harnesses, stainless steel clamps to hold cables in place and even lubrication fittings for maintenance of the drive assembly suggested to us this unit had been carefully thought out in advance, and was not "rushed to completion" to meet a show deadline.

**Motorized drives were abundant.** Indoor controls and displays ran the gamut from simple "left/right" switching to digital enhanced displays that give the user running reports on the antenna location and status at all times. Hero Communications showed off a new 20 position remote control system for their 12/15/20 foot mesh antennas and mounts, that marries both preset controls and unlimited horizon to horizon manual (push button) control of the antenna. Once again, we have not seen the last word in antenna automation systems yet!

**Our award** for the "biggest sleeper product line" might go to the innovative audio systems we saw displayed for the first time. With the start up this past August 1st of Music Television on transponder 11, F1, which features full multiplex stereo full time, products that will allow the home viewer to enjoy the benefits of full stereo sound with the TV service were on display. Microwave Associations - M/A COM had a very consumer oriented new receiver (the 4/MS) on display. It would get an award for styling. With it, as an optional accessory, they had a high quality multiplex stereo audio demodulator package as a companion piece. Arunta Engineer took the prize for audio versatility however with a do-everything audio demodulator that will handle virtually every audio format now in use on the birds; stereo or mono, full tuning of the audio subcarrier band from 5.5 to 7.5 MHz. We had mixed feelings about the sales "impact" of stereo audio with TV until we saw and heard the MTV transmissions at both the M/A COM and Arunta booths. Now we are convinced that any top dollar systems sold should and will include the stereo audio option. The sound is **that** good.

Around the exhibit floor we began to hear discussions concerning the heat build up at LNAs. This is not a new subject since it plagued the early commercial installations five years ago. This time around the problem, if there is one (we think there may be), involves the **mesh** surfaced antennas. IF you have a 16 foot mesh surfaced antenna that has 50% of the surface area "removed" (i.e. air replaced hard surface), and the mesh is essentially a bright metal, then you have the mesh reflecting sunlight back towards the feed and LNA region. A 50% open surface 16 footer will have a sunlight reflection efficiency equal to a solid bright surface (i.e. unpainted) dish of **approximately** 1/2 the TVRO reflector size. That says a 16 foot mesh antenna will capture and reflect (and focus) sunlight approximately like a 8 foot solid surface would. You can boil water, quickly, with an 8 foot shiny surface pointed at or near the sun. The solution to this one is to coat the mesh surface with some type of light diffusing or scattering surfacing material. We would expect bright, shiny mesh surfaces to quickly graduate to earth tone brown mesh surfaces in short order. Or, for designers of this type of antenna to **prove** to those concerned that mesh does not reflect sunlight after all **and there is no problem!** In the interim, the non-mesh antenna suppliers are having a hay day selling against this feature.

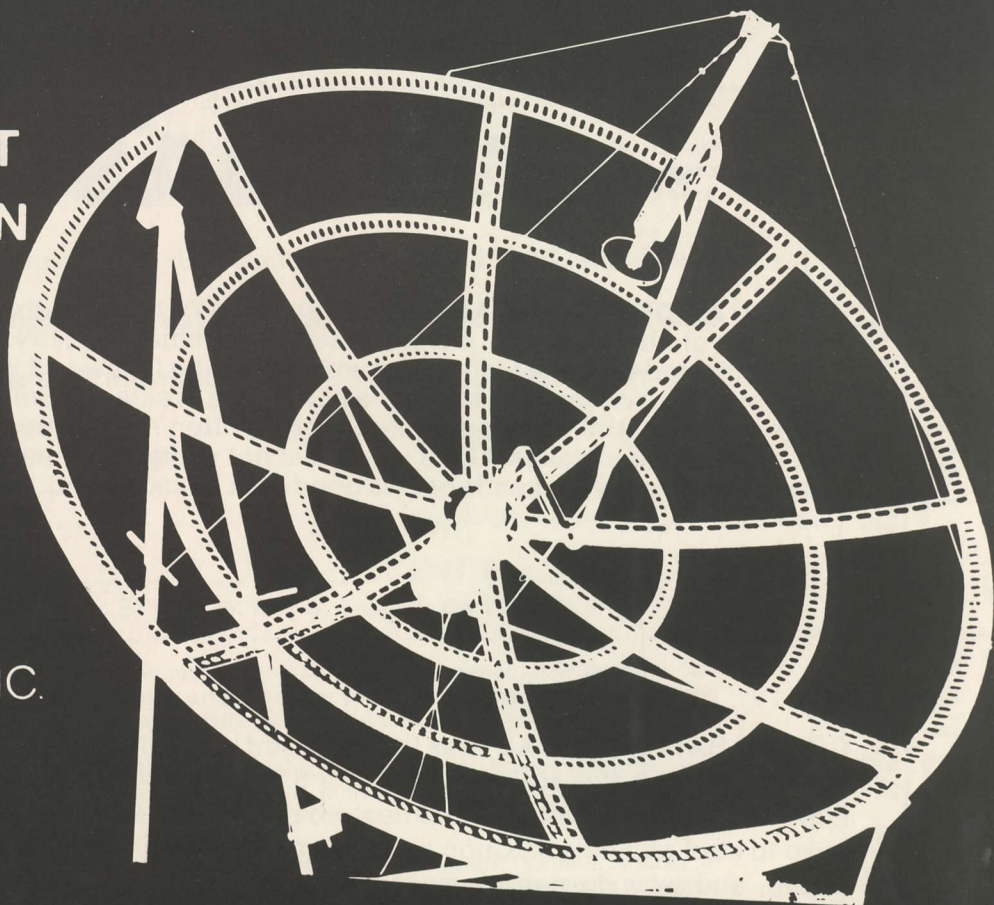
On reflection, Omaha '81 was quite a gathering. We suspect it will be remembered as one of the top events in the series and from it may come more new technology, and refinement of old technology, than from any prior "show". Now the sights are set on the **Satellite Video Show** in Anaheim, California November 20-22. See you there!



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- Packs in a 7' x 5' x 3' crate

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- Includes reflector, tracking polar mount, prime focus feed and L.N.A. rotator

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- Additional bolt-on sections allow expansion to 15 feet

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12 foot diameter  
41 dB gain  
1.5° Beamwidth (-3dB)  
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**IF YOU MADE IT TO OMAHA** - you were given 72 hours to soak up all of the basic “do’s” and “don’ts” of the home or private satellite terminal industry. You learned about antenna shortcuts and antenna techniques which **must** be followed if you want top performance from your system. You learned that not all LNAs are created equal - even when the manufacturer says they are! And you learned that there is often more hype than substance in many of the receiver supplier claims. **ALAS** - if you did not make it to Omaha you probably are wondering how you can get your hands on this good data. Stick around. Read on. We are about to tell you how.

**PLUS** - a pretty comprehensive look at the satellites, how they differ, what each one has as a weakness and strength. What you can do (and not do) about terrestrial interference. Or cable loss. Or sharing one antenna with several receivers. Things you can “tweak” upon, inside of the receiver. And things you cannot. Why the FM satellite signal is so far superior to terrestrial AM TV transmissions. And what that means to you. This Manual will keep you out of trouble. And save you money. It’s called “Coop’s Basic Manual” and it is available now. For immediate shipment. Order form to your right, at top of page. Price? A modest \$30.

IF FEED LNA FLANGE OPENINGS ARE TOO SMALL:  
 A → B, LOWER CHANNELS ARE DEGRADED  
 OPENING IS TOO LARGE (E → F), HIGHER CHANNELS ARE DEGRADED  
 OPTIMUM SIZE IS 2-2/16 IN.

will keep the circular insert from fitting properly into its seat in the connector body proper.

**Q**When screwing the connector together, the circular insert to which the shield is soldered is often not properly seated down into its 'bed', inside of the connector. You will notice that you cannot proceed to tight-



**USE TUBING** cutter to carefully cut through outer cable jacket/shell, and pull off section per connector instructions.



Local Oscillator Signal

TVRO Receiver

Isolator

From Splitter

3.7 to 4.2 GHz

IN

ISOLATOR, INSTALLED AT RECEIVER INPUT, REDUCES "BACK-FLOW" OF RECEIVER LOCAL OSCILLATOR SIGNAL TO TRANSMITTER SPLITTER AND THEN INTO OTHER RECEIVERS.

2) The receiver's internal devices are often confusingly made up as to which end is which. If you swap the ends, the transmitter will go right on transmitting, but the receiver won't receive. So receivers will often go into a destruct mode they get DC voltage into their inputs. Very carefully study the instructions and make sure you have the polarity correct. crystal clear, check with the manufacturer before installing it and applying power.

3) When you pull a coaxial cable off of an LNA, and the cable has DG on it, you must be extra careful with the design of the cable connector. Type I connectors have a center pin that easily shorts to ground if you don't align it properly. Annoying, this would not make any difference; lose power in the coaxial cable, shorting or touching the center pin against a ground will probably blow your own RX or supply.


Some people have expressed concern about electrical shock from the electrostatically charged antenna. This is not true. The antenna, a DC loop and similar to di-similar materials together. Look at the battery terminals on the top of your battery. Smack that with a flakey jump? That's the direct result of static charges.

Electrolysis, if it is formed, on a 4 GHz carrying current, is negligible.

[illegible]

3740

WHEN POLARITY OF LNA PROBE MATCHES, C  
CORRESPONDS TO INCOMING HORIZONTAL WAVE  
WITH 2 ILLUSTRATED, YOU RECEIVE HORIZONTAL  
SIGNALS.



3720 3760  
(1) (2) (3)  
3740

WHEN POLARITY OF LNA PROBE MATCHES INCOMING VERTICAL WAVES (TR 1, 3 ILLUSTRATE) YOU RECEIVE VERTICAL SIGNALS.

--	--

OP'S BASIC MANUAL

So, as you can see, satellite television recaptures the art or science of making small systems in that **every part of the system is functioning**.

**FOOTPRINTS - WHAT DO THEY MEAN?**  
Satellite system operators (SATCOM, ANIK, etc.) are all required by various regulatory agencies to provide coverage maps to the licensing authority. In the satellite business, these maps are called "footprints." They illustrate the satellite operator's intended coverage and they also illustrate the expected footprint which the satellite will achieve.

There are three possible types of footprint for the satellite system designer.

1) **Global Beam** - This is a coverage beam from the satellite's location, all of the earth's view, below. From a satellite altitude of 22,000 miles, the footprint of a satellite can "see" approximately 40% of the earth's surface. Thus a Global Beam pattern requires one preposition, over 40% of the earth's surface.

2) **Hemisphere Beam** - In some satellite systems, a satellite can only see a portion of the earth's surface. For example, a satellite in a low orbit can only see a portion of the earth's surface. Thus a Hemisphere Beam pattern requires one preposition, over 40% of the earth's surface.

size is covered by a single transmitting antenna, so that the satellite could send signal only to the world north (or south) of the equator, or only that portion east of (or west of) the equator. When the satellite is in operation, INTELSAT employs some permanently hemispheric and some switcheable from the ground, on command hemispheres. The latter are called "east" or "west" or



**COOP'S BASIC MANUAL** - This is the brand new STTI Manual that is devoted entirely to the fundamentals of designing and installing a top performing private satellite terminal. What you **MUST DO** to get peak performance, on every transponder, all of the time. The little things nobody ever tells you about. Stuff you need to know!

**NELSON PARABOLIC MANUAL** - So you want to build your own dish? Nelson Ethier shows you how, using a very basic technique that combines aluminum and fiberglass materials that you can duplicate in your own garage or backyard. A 10 or 12 foot, high performance antenna is yours if you follow the detailed instructions in this Manual, and spend around \$300 to \$400 of your own money. What a way to go!

**GIBSON SATELLITE NAVIGATION** - The first time you try to find a satellite you will wish you had this Manual. Author Steve Gibson boils down the complicated world of navigating your satellite dish through the skies to several easy to understand and follow "basic" steps. And if you want a computer interface to your dish tracking controls, that's here too!

\_\_\_ **YES** - Send me **Coop's Basic Manual**. \$30 (US, Canada, Mexico) or \$35 (elsewhere) enclosed.

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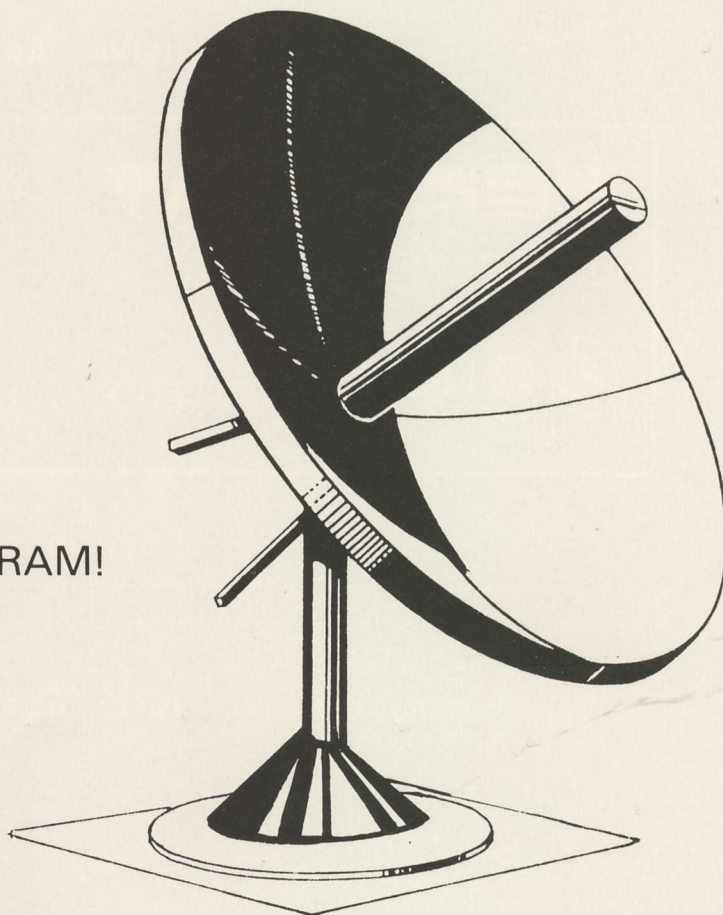
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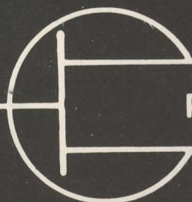


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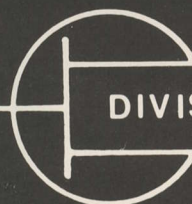
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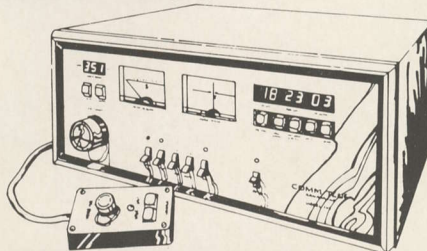
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8. Dual polarity driver board optional
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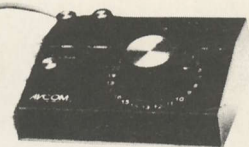
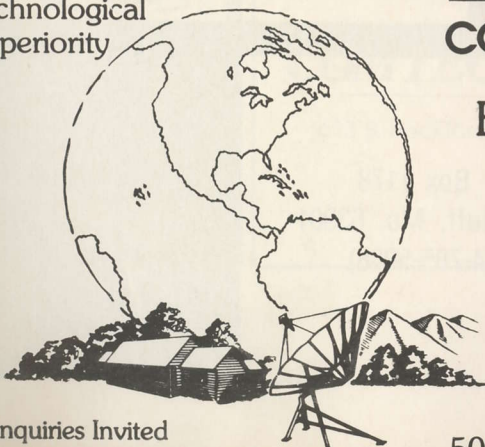
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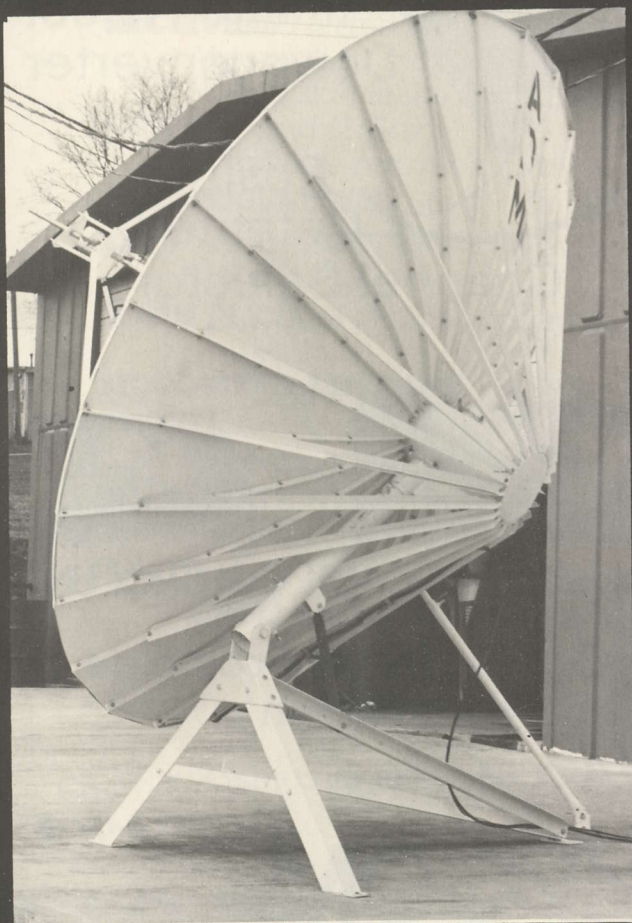
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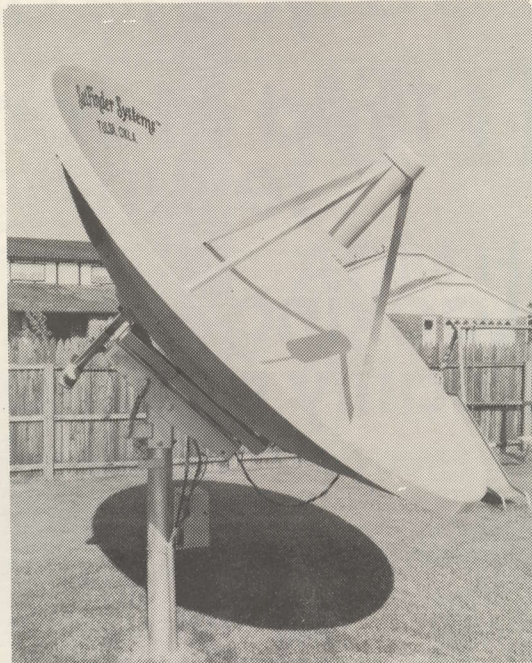
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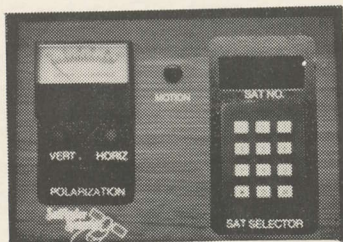


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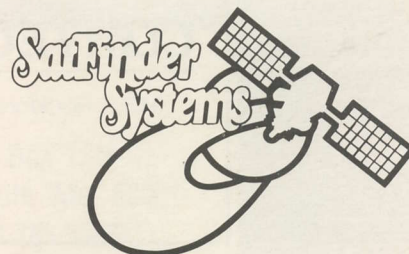
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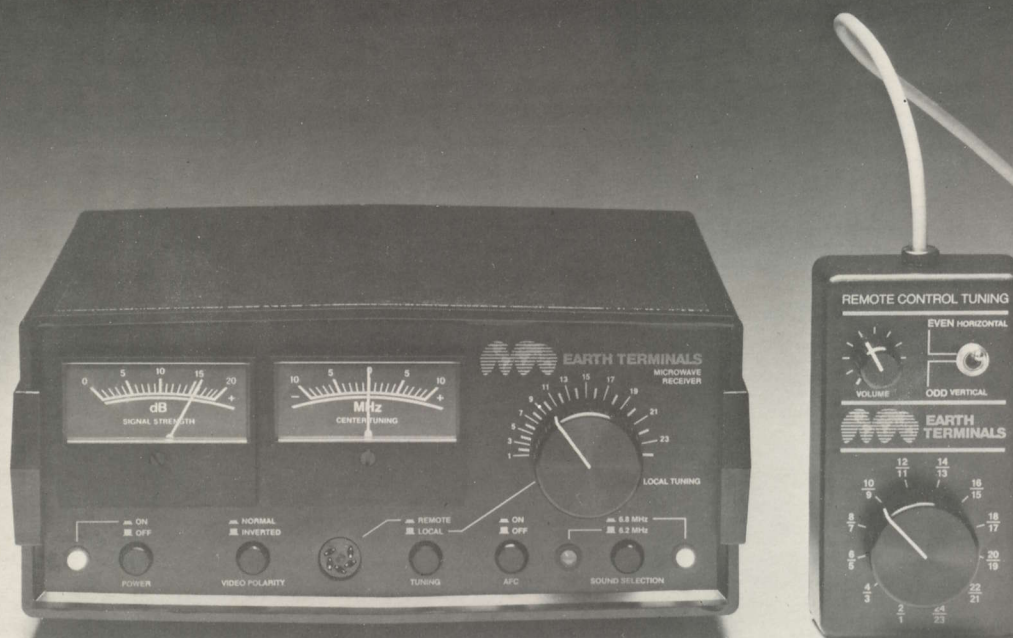
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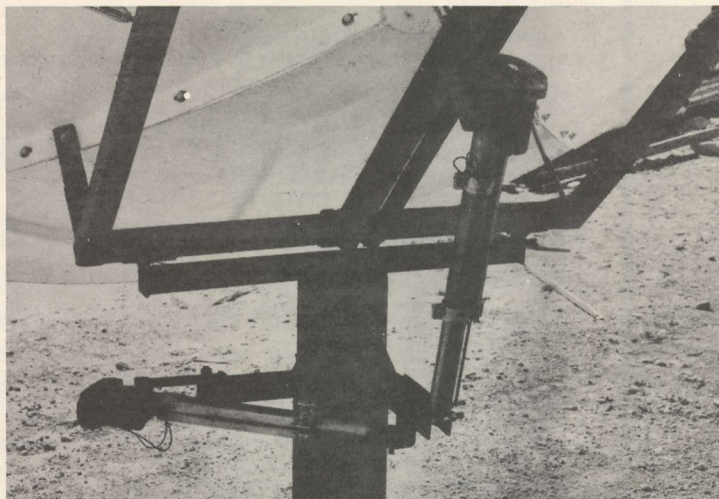
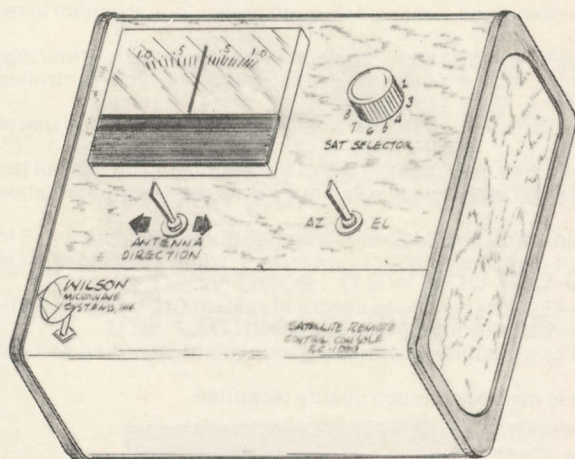
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With the exclusive 4 point Williams' mount, you are assured a quicker installation and that the antenna will be more securely fastened to the Vari-Mount. The antenna struts aid in stabilizing the fiberglass for operational reception in winds of up to 50 - 60 MPH.

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Wilson can now supply you with a complete system for turnkey operation that includes everything that is required for installation. The package includes the fiberglass 11' antenna featured above, receiver, 120° LNA, modulator, and all cables required. Many options are available.

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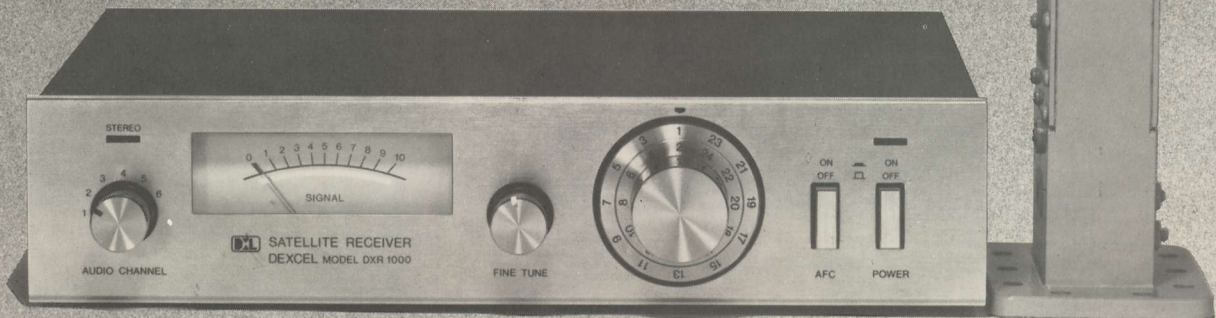


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The latest technology in satellite communications integrates the low noise amplifier and downconverter into one compact unit. The 70 MGz output at the antenna focal point eliminates the need for bulky cable, expensive connectors, short cable runs, or a separate downconverter. This system is a Must for those dealers who want to stay ahead of the competition . . . At a price you won't believe!



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Low Noise  
Amplifier/Downconverter

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- Remote control option
- 11 ft. parabolic, fiberglass antenna
- 4 piece antenna design for low shipping costs and easy installation

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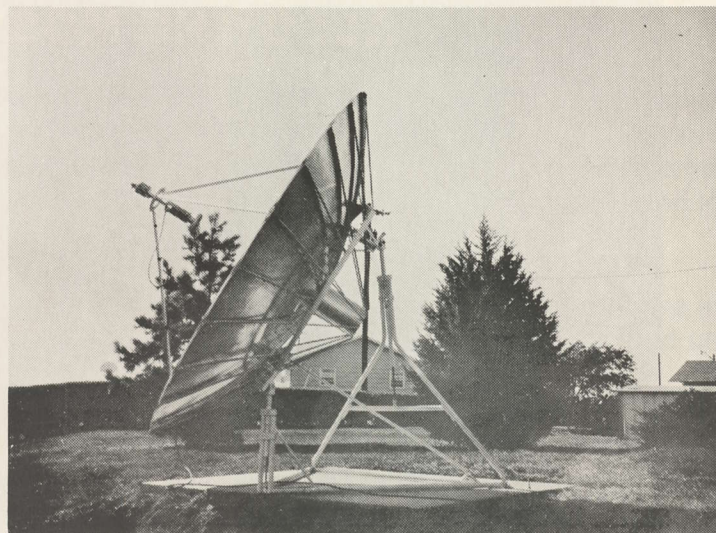
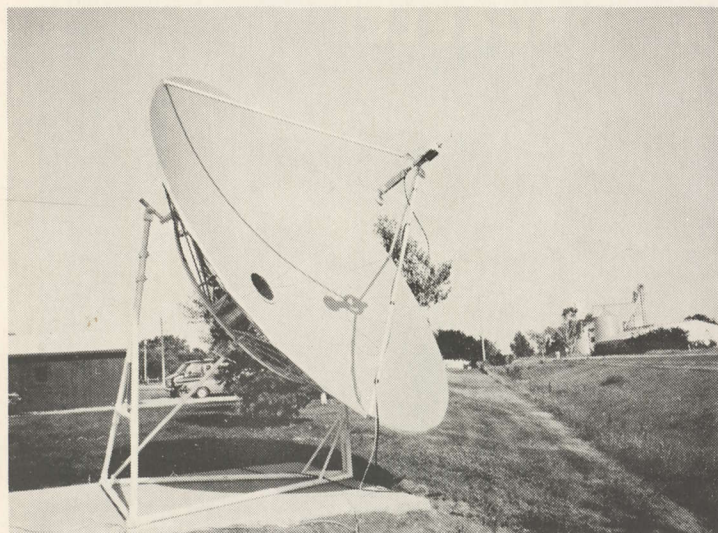
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Diameter - 12 Ft./ (3.6 Meter)  
Construction - Aluminum (24 Section)  
Gage - .060 and 3/4 Hard  
Gain - 41 DB Nominal  
F/D - .375  
Wind Survival - 100 MPH  
Antenna Weight / Mount - 525 Lbs.  
Shipping Weight - 595 Lbs.

## [ANTENNA-INCLUDES]

- Steel Polar-Mount
- Rotor and LNA Mount
- Rotor
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- White Finish
- Triangle Base

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0011

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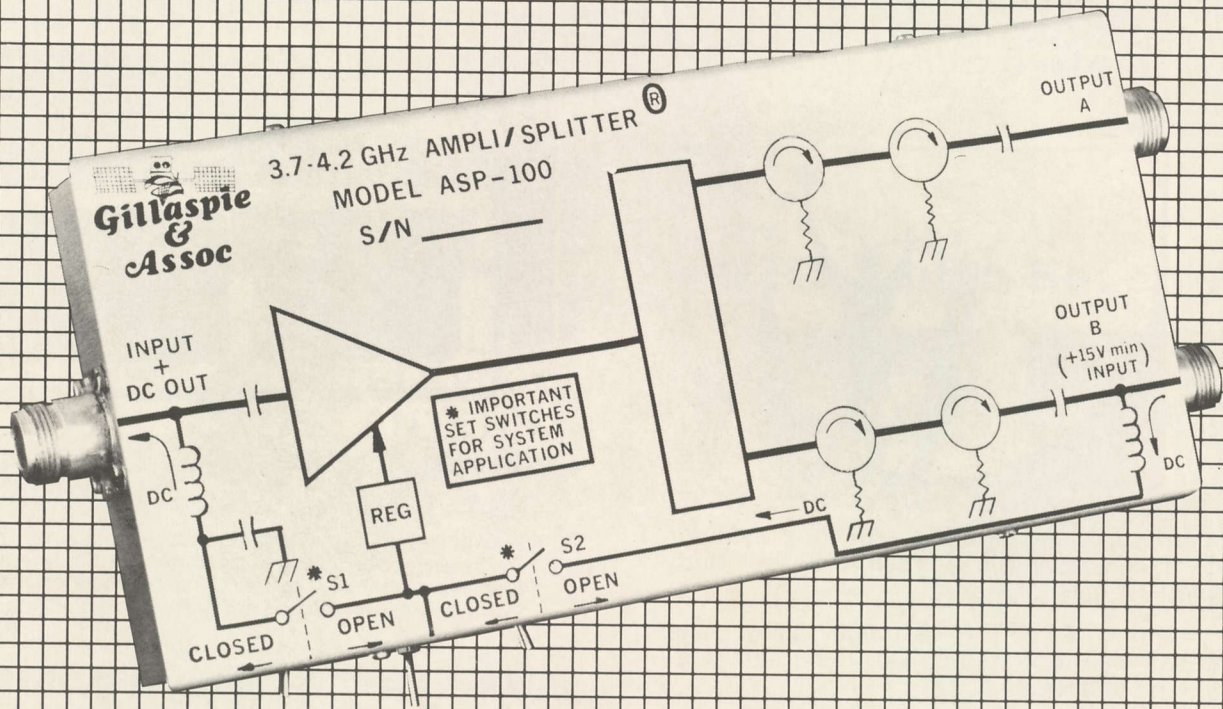
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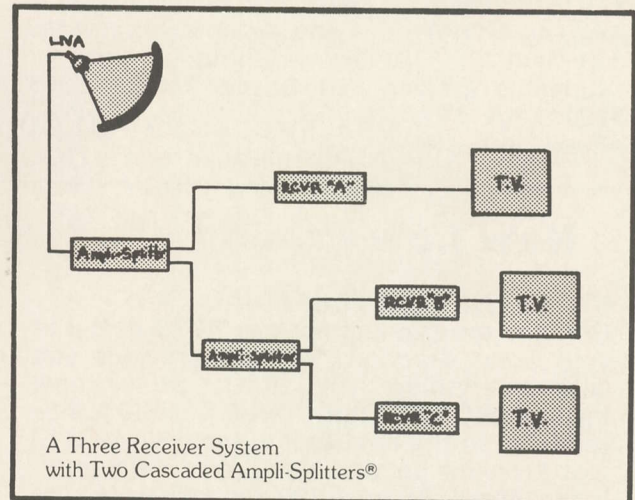
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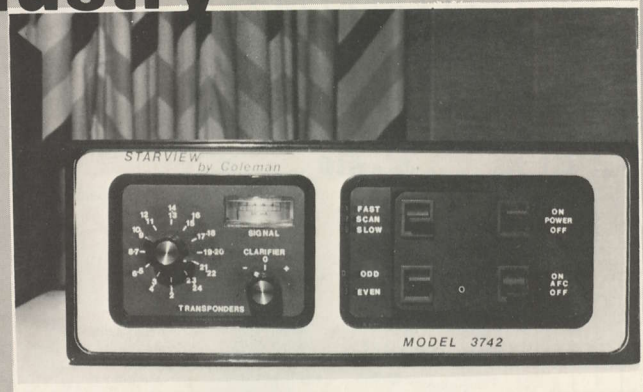
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U.P.S. Shipable anywhere in USA.



**Price \$1595.00**

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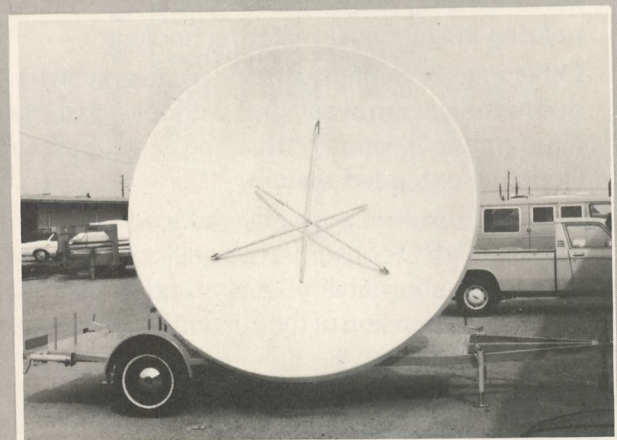
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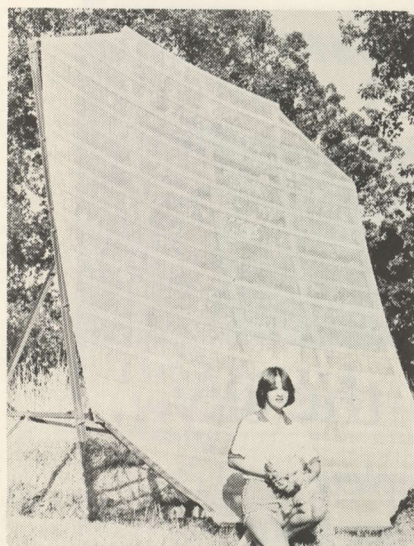
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**NOTICE!!** — Vidiark Electronics, pioneer of the famous “8-Ball” satellite antenna has developed and is now in production of an all new **high performance** satellite receiver. Also, from now on, will be operating under the name of **McCullough Satellite Systems, Inc.**

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TELEVISION  
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**PRICE:** Less than half the cost of other antennas.

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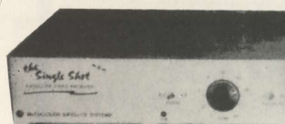
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8-ft.	\$495	\$395	30	25	65
10-ft.	550	445	45	40	80
12-ft.	595	475	60	50	100

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Avantek LNA (120° In Stock) ..... \$570.00

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**Single Shot  
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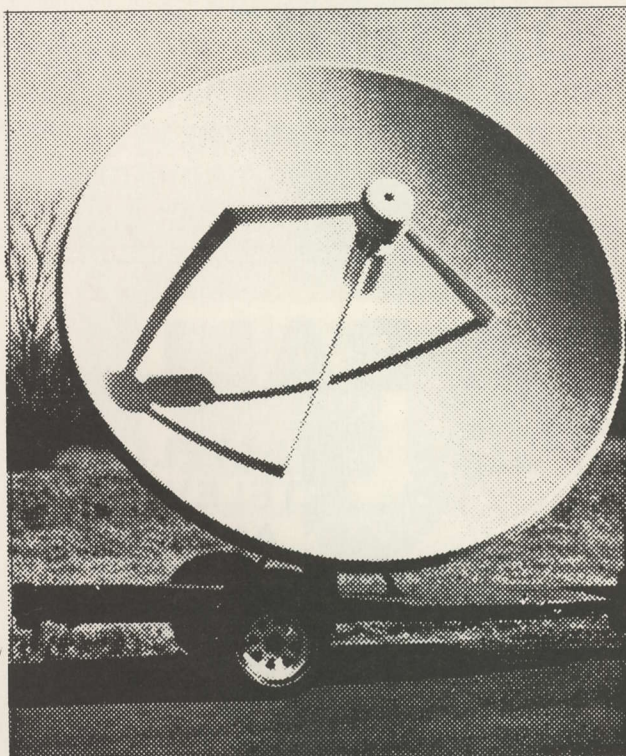
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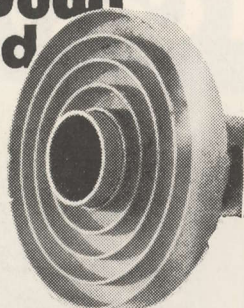
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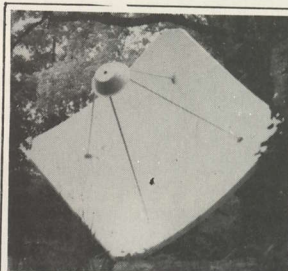
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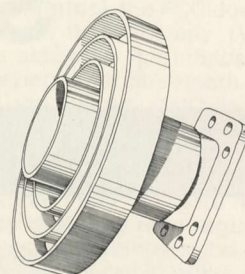
## CHAPARRAL.....

### New Products for Expanded Flexibility

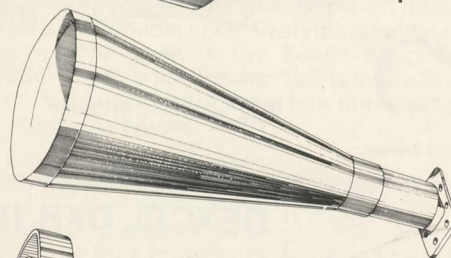
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We put the same imaginative design and hard-nosed testing into the Chaparral **Super Spherical**, a new feed that squeezes more performance from spherical antennas than any other feed on the market.

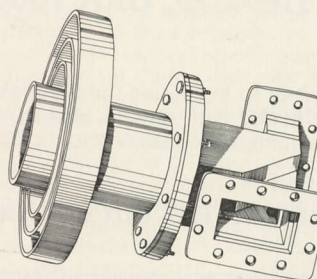
The Chaparral **Dual Feed** is our newest product. Adaptable to parabolic and spherical antennas, Dual Feed is the most efficient choice for suppliers who want clear reception from both polarities with a single unit. Building on the proven performance of Chaparral's Super Feed, the Dual Feed delivers better than 1.2:1 VSWR and isolation of at least 30 dB.



Super Feed



Super Spherical



Dual Feed

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COMMUNICATIONS

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## A: Don't

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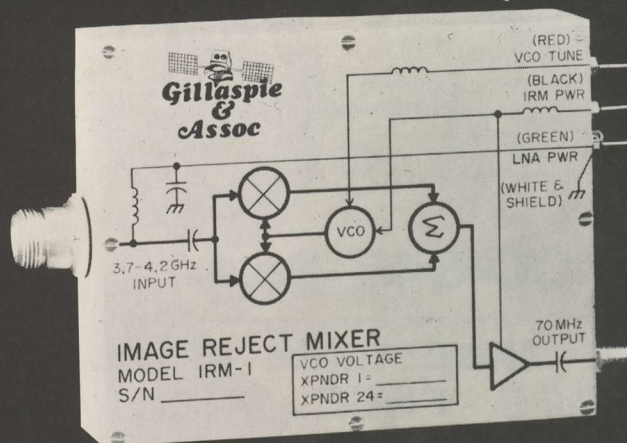
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A sensible solution. Another benchmark. Thoroughly shielded housing. Completely weatherized. Mounts at the antenna. Allows for longer antenna to receiver runs. Uses low cost RG59-U cable. Pioneered by Gillaspie and Associates. Get the last word FIRST.

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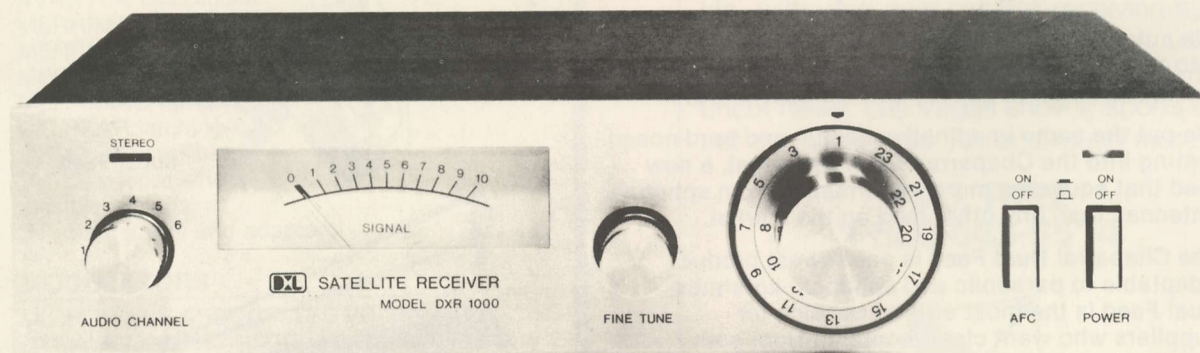
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## COOP'S COMMENT ON PROGRAMMING

### WELCOME TO HEATHKIT

It was at the February 1980 SPTS that we first saw representatives of **The Heath Company** displaying an interest in private, satellite terminals. Several attended and in the months that followed a number of LNA, receiver and antenna suppliers (of that era) received personal visits from Heath. At one point, around May of 1980, at least one 13-foot antenna manufacturer felt he had reached the point where his future was assured; he proudly announced that he was to supply Heath with 100 13-foot motor driven antennas per month.

In the interim The Heath Company has become a part of The Zenith Corporation. Zenith of course knows something about selling television reception equipment; they currently enjoy a number two position in TV receiver sales nationwide, right behind RCA. In other not too distant years they have led the sales curve, ahead of RCA.

Page 10 of the latest (Fall 1981) Heath catalog devotes a full page to a 3 meter "home earth station" now being offered by the firm. Full page color advertisements in publications such as **Radio Electronics** also feature the new Heath terminal. Like the Channel Master entry into the market last May, the business will never be quite the same again.

The Heath system is, as reported some months ago here, largely the combination of Zenith and Scientific Atlanta technology. The 3 meter antenna (six section), the "Earth Foundation Kit", the combo LNA plus downconverter (exiting the antenna "in the 500 MHz band") all mount outside; and all come from Scientific Atlanta. The indoor receiver has SA "guts" and Zenith cosmetics. The price for the package is \$6995 ("basic Heathkit Earth Station").

**There are several aspects** of the Heath terminal marketing program which beg your attention. First Heath urges potential buyers to spend \$30 on a "Site Survey Kit". What you get for this is a computer printout showing satellite look angles for your site, a compass to determine the headings, an inclinometer to check for elevation clearance. You also receive a "manual" explaining earth stations in general, and the Heath earth station in particular, plus a copy of "Sat-Guide". This is not an interference study program. In fact, no place in the preliminary literature does Heath mention the potential problems of terrestrial interference.

**With distribution** of their catalogue plus the full page color ads now popping up all over the Heath marketplace, there will be in excess of "1,000,000 reader impressions" in the first 30 day period. That's a lot of people reading about home TVROs, and seeing that a firm of national scope and integrity is now offering product. It cannot hurt anyone in the industry.

**That is a plus.** A questionable negative is some of the fine print buried in both the Fall '81 catalogue and in the full page advertisements. It reads like this:

**"Viewing of satellite TV channels may require the customer to obtain permission from, or make payment to, the programming company. The customer is responsible for compliance with all local, state, and federal governmental laws and regulations, including but not limited to construction, placement and use. For use only in Continental U.S."**

This is an intelligent statement. It shifts the responsibility for compliance with whatever regulations or laws as may apply away from the supplier and directly to the user. And of course that is as it should and must be. But then Heath has more fine print language which is at best confusing. It reads:

**"This device has not been approved by the Federal Communications Commission. It is not, and may not be, offered for sale or lease, or sold or leased until the approval of the FCC has been obtained."**

As we discussed in our recent July issue (see **Coop's Comment on Programming**), the FCC does not and has not required approval from them for any TVRO hardware or systems. Microdyne asked for it, perhaps (it now appears) because they were trying to get "the Heath Order". Most of us learned a long time ago that you don't go to a bureaucratic group and ask their permission to do something new (and not covered by their regulations) unless such permission is absolutely required. By going to the Commission when you **don't** need to, you force them to create new policy to deal with you. **New policy is simply new regulation.**

That indiscretion aside, Heath is to be congratulated for putting together a reasonably state of the art home terminal package for a reasonable price. Everything in this package is high quality, right down to the Zenith Space Command Remote Control system. Now the "fat" is in the fire, it will be educational to sit back and observe how the Heath marketing program works in the real world.

CSD

PROGRAMMING



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## THE LORD, AND JOHNNY CARSON ON ST. MAARTEN

This report is about how the Lord and Johnny Carson helped close a deal for a satellite terminal on the island of St. Maarten in the eastern Caribbean. It was during the recent (late May) Consumer Electronic Show (CES) in Chicago that a resident of St. Maarten, a tourist related businessman, approached us at our display to inquire about the feasibility of receiving US television (any US television) on his island, via satellite. He told us "Scientific Atlanta advises us there is no way of seeing any American signals on St. Maarten unless you install a ten meter dish". Well, that seemed like a reasonable enough challenge. And to the best of our knowledge no attempts with systems of any size had been made in this portion of the Caribbean previously. There is quite a chain of islands through the region, mostly English speaking but including some where Dutch and French is the "official" language. And so an arrangement was made. The St. Maarten resident agreed to pay the costs of the trip including any overweight or oversize luggage charges (international flights restrict you to 66 pounds or less). If the tests were not successful, there would be no charge for the survey. If the tests were successful but no system was purchased, a survey charge would be paid by the St. Maarten resident.

**Before heading off** for St. Maarten it seemed like a good idea to put the Hero computer to work to determine the azimuth and look angles for the island. Like many islands in the Caribbean, I couldn't even find it on my large wall map in the office. However, being a ham radio operator has its side benefits; a check of a popular amateur publication listing all of the radio "countries" of the world revealed it to be at 18 degrees north and 63 degrees west. Ouch. Into the computer went the numbers and back came the coordinates to the island; FI had a look angle of only 8 degrees. F2 on the other hand had risen all the way to 24 degrees while Westar 3 was way up there at 52 degrees. From previous experience throughout the Caribbean it appeared F2 might be the best bet and any chances of finding FI seemed slim indeed; even if the horizon was "flat" towards the bird. An 8 degree look angle with a portable Umbrella antenna doesn't leave you much room for error (terrestrial noise being an always present problem).

The equipment was assembled:

- 1) Bob Luly's portable 12 foot version Umbrella antenna;
- 2) A DEXCEL 85 degree LNA;
- 3) An Earth Terminal (Washburn) receiver;
- 4) A portable polar mount for the Luly antenna;
- 5) Extension cords and interconnection cables;
- 6) A Sony 5" portable monitor (remember the 66 lb. limit);

by  
Bob Behar  
Hero Communications of Florida, Inc.  
1783 W. 32nd Place  
Hialeah, FL 33012

7) Our boyscout compass and a 15 cent protractor to use as an inclinometer (at the last minute our fancy unit disappeared from the storage room);

The equipment was packed into four cartons and we were ready for the "assault". Our St. Maarten flight was scheduled to depart at 5 PM but with the extra packages it seemed prudent to arrive at the airport early. Ah yes; international baggage restrictions. Eastern Airlines had a policy. The antenna, as small as it packs for shipment, was larger than the maximum size allowed for international flights. Any discussion with the counter person seemed to be headed no place fruitful so I asked to see a supervisor. I carefully explained what was inside the largest carton, and how it was going to be used to bring a "special" sporting event to the whole island. It was at this point I learned the supervisor was a "fight fan" and "yes", he would like to come to our Hialeah office to watch the blacked out fight this week. After he accepted that "invitation" (let's be generous and overlook the "bribe" nature of the invitation) to be our guest for the fight the oversized package suddenly became "no problem". Safely on board, the plane departed Miami on time at 5 PM and by 7:45 PM we were at the St. Maarten airport.

**Now my plan** was to head immediately for the hotel, set up the equipment, and run the tests **that evening**. The same Eastern airplane makes a "swing" from Miami down through the eastern Caribbean heading out from Miami one evening and returning to Miami the **next morning**. In theory you could leave Miami at 5 PM one day, go to St. Maarten, and be back in Miami around noon the next day.

My host met me at the airport but his vehicle was too small for the 12 foot Umbrella antenna. No other truck or station wagons were in evidence so it became time to improvise. The sun roof of the vehicle popped back and into it at a rakish angle slid the 12 foot satellite antenna. The people at the hotel were quite understanding and possibly kept their distance for fear of being fried or sterilized by the huge contraption. It took but a few minutes of searching to locate a spot on the grounds where AC power could be reached with the extension cords, and where the take off angles towards the American Geostationary/Clarke orbit belt were "reasonably" uncluttered. However, there was a constant breeze in the ten to fifteen mile per hour region at the best location and anyone who has worked with an Umbrella antenna knows that wind is a constant problem. So a second choice location, where a corner of the building provided shielding from the wind, was chosen.

Forty five minutes after landing, or 8:30 PM, equipment began coming out of boxes. At 9:15 PM everything was installed and the search for signals began. Now I would like to make this **sound** like a very complicated operation. The truth is that with a well designed mount, finding signals with the Luly antenna is just about the easiest thing in the satellite business. Yes, the more you do it the more experienced you become. But there is not much to it after you determine that the system itself (antenna, LNA, receiver and interconnecting cables) are all hooked up properly and working.

To that end, I decided to use a by now standard Caribbean Luly antenna check out procedure. The Russians will love this. Ghorizont at 14 degrees west puts a 29 to 30 dBw contour over the whole area. They are always on the air, 24 hours a day, with at least a test card. I swung the Luly antenna east, adjusted the receiver into the transponder nine region and there in the noise was the Russian signal. It was 9:40 PM and I had been on St. Maarten about two hours. And a crowd was gathering. Out of the corner of my eye I could see them edging closer and closer as I swung the antenna and then the receiver tuning. My host meanwhile was bordering on coming unwound. **Television**. No matter it was Russian. No matter it was noisy. It was television. **Satellite television!**

It took a few minutes to re-explain the system to my host, noting that we use the Russian Ghorizont bird for test and alignment, but that with the proper antenna signals from



Europe, including France, were available at his location. The crowd edged closer and several people carrying on in French were obviously excited. And then the search for American signals began.

**I started with F2.** Now this may seem like a strange choice to those of you sandwiched between the Rockies and Appalachians. There is, after all, only transponder 8 (NBC feeds) and transponder 9 (Alaska AFSN) on with regular video (23 is on a special Alaskan footprint and since St. Maarten is not part of Alaska we can rule that one out!). However, F2 has that delightful RCA antenna heritage. That means that off of bore-sight, in a region roughly 180 degrees separated from Alaska, there is a long-thin 26-27 dBw contour which seemingly extends to virtually the "horizon" for F2. St. Maarten is not squarely 180 degrees "off" from Alaska but it is in the neighborhood. And, most important, the bird was high enough in the sky to produce a decent look angle. With the Luly antenna you "pan" the sky. It helps if you have been a TV camera operator, although the "talent" can be learned starting with the receiver set on the transponder where you expect to find signals, you look for some indication of signal. On one such pan there was a "flash" of color bars on the monitor. I tried to find it again but the wind was coming up fast. While my host attempted to steady one side of the antenna, and I worked the polar mount, it became apparent that we needed some more help. Several of the hotel guests in the crowd stepped forward and offered to help. With three people holding the antenna and a rope on top to steady the contraption, we set out again. It took around 5 minutes of coordinated effort ("**everyone push left...slowly!!!**") and we found the signal again. The color bars locked up. In color yet, indicating we were perhaps no more than 4 dB from threshold quieting.

I was clearly pleased. My host, in his own excitement, commented "**You are acting like a person who has just had his wish granted by his girlfriend**". Having RCA for a girlfriend can be dangerous. Now it was time to rotate the polarity and check on the AFSN signal on TR 9; yes, there it was. Not in color but with good sound. It is surely a long ways from Alaska to St. Maarten!

Bouyed up by this bit of testing results, it was now time to attempt the impossible; F1. With the help of the hotel guests off we went again, bringing the polar mounted Umbrella down closer to the horizon. It took three minutes to locate CBN's "700 Club", live in black and white and with understandable audio. Everything after this was anti-climatic since I felt assured that we would be selling a number of our Hero six meter Super Tennas on St. Maarten, and on surrounding islands, as a result of these test results.

Through the horizontal transponders we found a trace of signal on 20 and 24. Note that 8, 20 and 24 share a common "F1 antenna pattern". **Nothing**, on the 12 foot antenna, on the **alternate** horizontal set of signals. Over on vertical, ESPN on 7 was the **best** F1 signal seen although still not in color. Traces on 3 and 23 were evident, but by now the wind was playing havoc with the antenna stability at this low look angle. Plus, I noticed that we were looking through a corner of the hotel building and some trees.

I would like to note that in our estimation the Luly antenna is an invaluable tool for antenna or site survey work. It makes far more sense to us to have this kind of portable antenna than a trailer mounted rig. You can hand carry the Luly antenna where a trailer cannot go (try to get a trailer onto Eastern Airlines!). Hero, in fact, encourages all of our dealers to invest in one or more Luly Umbrella antennas rather than trailer rigs.

**By this point the crowd had grown to perhaps 30 people.** Now seeing 30 people clustered about a 5-inch Sony monitor under spreading palms and island flora is not your common sight. The hotel manager wanted me to **leave** the whole system behind! Before packing it up for the night, it did seem like a good idea to check on the Westar birds. Westar 1 at 44 degrees was first. Surprise again; there was a PBS movie on transponder 8; not great but there were flashes of color (perhaps due to the wind which by now was making



**NOT GREAT but in color (trust us!); F2's NBC feed on transponder 8 from St. Maarten. Another 4 to 5 dB would be full quieting.**

the antenna mount very unstable). Next stop was Westar 3 with a 50ish look angle. Again, some surprise. The signals were there but **not nearly as strong** as the W1 signal on 8.

Now part of being a good salesman, they tell me, is to end on a high note. So back I went to Satcom F2 just in time to tune in transponder 8 and to hear Ed McMahon say "**And here's Johnny!!!**". I suspect I could have stayed at it all night. I know that the local residents and tourists were ready to spend the night parked by the antenna. But I knew when to wrap it up, and when to start the packing up job, to make the flight back to Miami. It was 1:00 AM.

The next morning my host, whom I had first met in the Chicago CES show, joined me for breakfast. **The sale was completed.** Several six meter systems will be heading towards St. Maarten and other nearby islands about the time you read this. American television, and European television, will begin popping up now at resorts and other locations throughout the eastern Caribbean. None, to the best of my knowledge, will be "Scientific Atlanta **ten meter** terminals".

It is now 12:15 PM and just 19 hours ago I left Miami bound for the eastern Caribbean. My airplane is just touching down and the really tough part is ahead; trying to explain to the US Customs people just what this strange equipment is all about. Oh yes, this suggestion to every manufacturer of satellite hardware in the USA. If you folks will imprint on your equipment (or mount a plate, in the case of antennas) "**Made in USA**", you will make it far easier on those of us who carry gear out of and back into the USA. It is enough of a hassle to get the equipment through customs at each stop, but when you try to bring the equipment **back into the USA**, explaining what it is makes up only half of the battle; proving it was originally manufactured in the USA is the other half! And some designation of same on the product would be a big-big help.

#### Editor's Note:

Subsequent to his visit to St. Maarten with a 12 foot Luly Umbrella Antenna, Bob Behar (some now call him the Davey Crockett of the TVRO world!) headed further east and south to Barbados. The look angle to F1, on Barbados, is 5 degrees. Everyone, Bob Luly included, will tell you that at a 5 degree look angle a small aperture antenna, such as his 12 foot portable rig, will simply not make the grade. Earth noise will jump up and bite your CNR. Because of the pioneering data brought back by "Davey Behar" we are presenting this second report in tandem with the St. Maarten report.



## BARBADOS TEST OF 5° LOOK ANGLE RECEPTION

After returning from St. Maarten, the equipment not yet unpacked, we received a call from Mr. Malcolm de Freitas on Barbados. Malcolm had visited Hero a year previously, in Miami, and had purchased an ICM 4200 receiver and a Dexcel 85 degree LNA from us at that time. From a separate source he had acquired a 12 foot Lindsay antenna with a polar mount of sorts. At the time I asked him a few questions about his antenna choice, and then outlined what he should attempt to do to get pictures with that system in Barbados. I looked forward to hearing reports back since I felt reasonably sure he would see Ghorizont, Intelsat's Brasil feed and possibly something off of WESTAR from that location. During the course of the next few months I did talk with him, and a technician he had located from the local Cable and Wireless office, but they had no results. I was hopeful as time dragged on that his silence was due to him finally getting pictures, and simply forgetting to call back to tell me the results.

At the recent CES gathering in Chicago, Malcolm again appeared. **He had never gotten any pictures.** He was convinced his antenna was too small. I was not so sure that was the problem totally since he had not even seen Ghorizont; a signal so strong that the proverbial "wet piece of string" should produce results. Malcolm then explained some of the difficulties he was having getting the polar mount to function properly and noted that in his discussions with the manufacturer they admitted to some design flaws with the system.

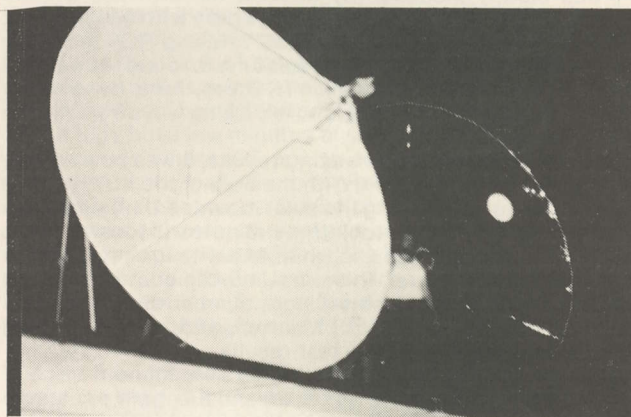
I suggested Malcolm call me back in late June, knowing that I was probably headed for St. Maarten in mid-June. After reporting to him on the St. Maarten results he asked me to pack up and come his way. Less than sixty minutes after I hung up Eastern Airlines called to advise they had a ticket waiting for me at the counter. Fortunately, everything was still packed up from the St. Maarten adventure, complete with the special "baggage labels" Eastern had previously supplied. That would prove to be a practical solution to the "oversized" baggage problem Eastern first hit me with on the way to St. Maarten.

I arrived in Barbados at 9:30 PM on July 7th. Malcom had posted a bond with the folks at customs so we could get the equipment into the country. By 10:15 PM we were winding our way across the 21 by 14 mile island and I suggested to Malcom that he get moving if we were going to watch Johnny Carson that evening. Along the way the Cable and Wireless technician explained what he had done to try to find satellite signals, and he offered that **"nothing less than a 42 foot dish will produce US domestic signals here...and they will be noisy"**. A 42 footer was clearly not in Malcom's plans. I had arrived on Barbados with one of those nasty summer colds; I was completely deaf in the left ear and the right ear was not working very well either. **"Just hold your questions until we have pictures; then I'll be happy to answer the questions"** I muttered.

It was 11 PM when we arrived at Malcom's house; a light rain was falling. Malcolm had a considerable number of friends and employees on hand to witness the great experiment. All I wanted to do was to get the antenna up, electronics hooked up and prove it would work. The most pressing thing on my mind was falling into bed and try to shake the cold.

It took exactly 38 minutes to get everything unpacked, hooked up, and to find Johnny Carson in his opening monologue on F2. We had the usual problems with the wind but the crowd on hand exploded in excitement. I even felt better and momentarily forgot my cold. By 1:15 AM the initial adrenalin had subsided and I was headed for bed. Malcom was begging me to stay an extra day to help him get his own 12 footer operational. I said I'd decide in the morning, consumed an overdose of liquid cold medicine and collapsed. At 11:00 the next morning Malcom and I sat down to decide what to do next. The crowd on hand the night before had "talked" and a newspaper reporter was on the way to meet with us. I really felt badly about simply folding up my antenna and disappearing back to the states; perhaps something **could** be done to get his 12 foot Lindsay to track properly. So we took a close look at the antenna system, and I discovered that:

- 1) It was never designed to operate at a 13 degree latitude (Canada being far to the north of this latitude) and would not come "up" for high look angles;
- 2) There was no declination "adjustment";
- 3) Adjusting the elevation, through the limited range, required four people all working in concert;
- 4) As installed, it was not tracking the Clarke orbit belt at all;
- 5) With due south as "0 degrees" it would not go further than 55 degrees in either direction before it ran steel into steel.

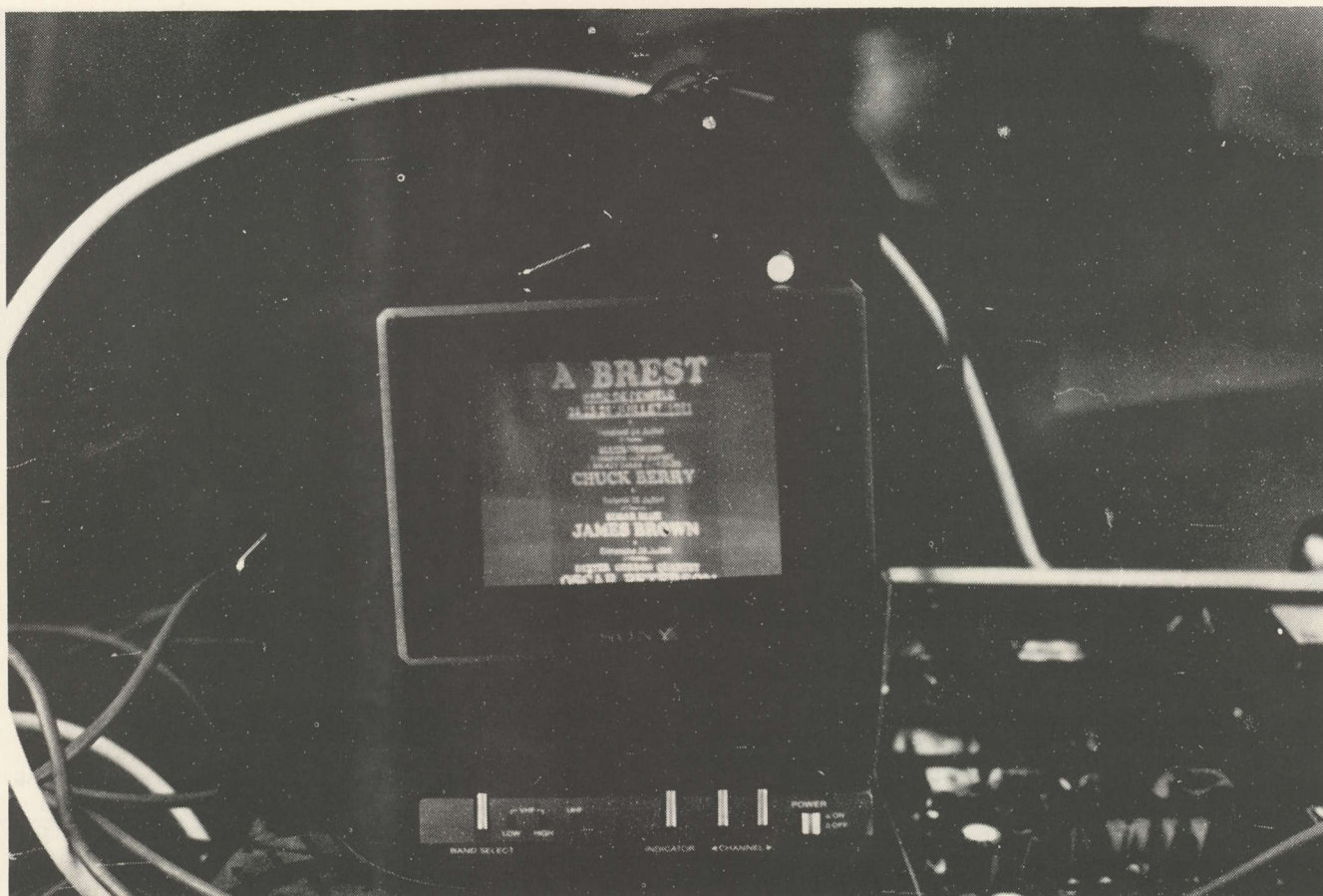


**WHITE and BLACK** - of it. Lindsay 12 footer, mount modified for low look angles, and Luly 12 footer; both aligned on F2 from Barbados.

I suggested that we scrap the polar mount configuration and field modify it to an Az-El, since that would at least allow us to prove out the dish surface. It took over an hour to loosen enough parts to get the antenna to manually swing east to Ghorizont. I knew that the Ghorizont signal would be there no matter how far off the feed centering might be; they are **that** strong! I set the Washburn receiver to transponder 12 and we swung (pushed, and shoved would be a better description) the antenna east. All of a sudden there was in excess of 50 dB SNR; some of the best pictures I have ever seen. But it was not Ghorizont. The program feed continued until 1:50 PM (eastern daylight time). **We had found a feed from Symphonie**, the French bird, nominally parked at 11 degrees west. Having proven that Malcom's 12 foot Lindsay dish would play I decided standing out in the rain was doing my cold no good. I returned to my hotel until 7 PM.

Malcolm picked me up. The rain had cleared, and the air





**SYMPHONIE SERVICE** - direct Paris evening newscast, weather and local announcements. Look for it around 1 PM eastern, 11 degrees west, transponder 12 on 24 channel receiver, 6.8 audio.

was nearly dead calm. Obviously, a good night for satellite hunting with the Luly antenna! I had already noticed a spot on top of Malcolm's roof where I thought we could get a shot at a 5 degree look angle bird. What followed was very surprising. It took less than five minutes of looking to come up on CBN's transponder 8; not strong enough to key the color in the Sony monitor but watchable in black and white. With the wind calm we could lock down the base on the Luly antenna and rotate the feed around for optimized reception. The metering circuit on the Washburn receiver is a big help in this exercise. What we found was as follows:

**Vertical** / transponders 3 and 5, very noisy video and no audio. Transponder 7, decent black and white video, faint audio. Transponders 9 and 23, sync only on video, no audio.

**Horizontal** / transponder 8 black and white and good audio. Transponder 12 better black and white (still no color), good audio. Transponders 6 and 20, sync pulses only. Transponder 24 weak black and white, no audio.

Malcolm at this point wanted to check out his ICM 4200 receiver. I remembered this particular version of the ICM's as being very sensitive. We hooked it up, and found the receiver which had been stored at Malcom's for about a year lived up to its reputation:

**Vertical** / transponders 1,3,5,9,23 all with black and white video and varying qualities of audio. Transponders 7 and 17, **color** (!) and good audio. Transponders 13 and 21, sync pulses only.

**Horizontal** / transponders 2, 8 and 12; **color** with good to excellent audio (8 and 12 best). Transponders 6 and 18,

black and white video, no audio. Transponders 10,14,20 and 24 black and white video and varying qualities of audio. Transponder 22, very weak sync pulses.

We went back to transponder 12 to watch the end of a Showtime movie while Malcolm and friends moved the Lindsay dish to F2. Even with the modifications it took three men to re-aim the antenna. Using the Luly antenna heading as a guide we sited across the Luly to "eye-align" the Lindsay antenna on the same heading. I transferred the electronics, and threw the switch. There was Liberace playing the piano on F2 TR8. Malcolm screamed with delight; his one year wait for US television was over. Now he had it!

By now it was 1:30 in the morning. In thirty minutes I had my Luly antenna and gear re-packed and headed for the hotel. Malcolm picked me up at 7 AM to run me to the airport. "I didn't get much sleep" he confided. "At 4 AM they still had color bars going".

Malcolm kept the Washburn receiver on Barbados, largely because of the metering which is very helpful for antenna peaking. The outstanding performance from an ICM receiver which is no longer in production was a pleasant surprise to me. For those who may follow to the far eastern side of the Caribbean, this advice:

1) A good six meter (i.e. Super-Tenna) antenna equipped with an 85 degree LNA and a top notch receiver such as the Avcom will produce useable FI signals on **no less than** transponders 7 and 17, 2, 8 and 12. **In color**. F2's TR8, with NBC feeds currently on it (although no guarantee of the future) will be at or above threshold.

2) With new generations of satellites coming up over the next few years, there is the likelihood that other (US



domestic) birds will also be available there; and that suggests a motorized antenna.

Malcolm de Freitas is now in the satellite package business. He has already lined up several customers in his part of the Caribbean, and the first full package will be heading his way in September.

## CUBA USES GHORIZONT TO BECOME SATELLITE BROADCASTER

### CUBA's BACKDOOR GEO-SAT PROGRAM

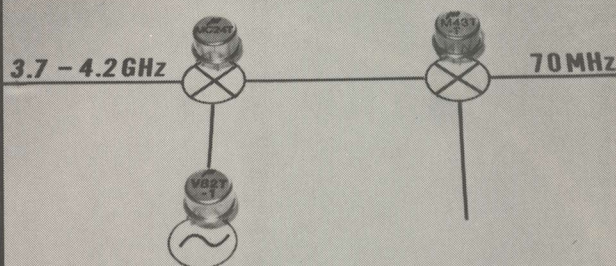
There has been no secret that the Russian Ghorizont bird, parked more or less at 14 degrees west, has been feeding Russian/European television to Soviet influenced Cuba for nearly two years now. During the 1980 Russian Moscow games, for example, South Florida's Bob Behar and many others found the Russian games, complete with Spanish audio, being transmitted to Cuba via Ghorizont.

The Russian Ghorizont bird family is unusual because it combines the Clarke orbit geo-stationary positioning with the type of relatively high power transmitters which one finds on Molniya. Accurate data, that can be verified, as to the **actual** output power and resulting EIRP of the Russian Ghorizont birds is difficult to come by, but in the right hand circular mode it would appear to be at least 33 dBw on some transponders.

Ghorizont II maintains a Clarke orbit position in the 14 degree region. This particular bird has been noted in Europe with extremely strong signals (noise free on an 8 foot dish and 180 degree LNA) which translates to EIRPs in **that** direction of at least 37 dBw. Up to five video transponders are active at a time and all five are noted with varying levels of EIRP quality in southern Florida.

Because the bird utilizes the Intelsat polarization format (right hand circular), you **can see it** with a **linear** feed. That is, although the signal looks like a twisting corkscrew coming at you (assuming it could be visually seen), at least a portion of the corkscrew roughly approximates vertical polarization and another portion approximates horizontal polarization. Thus you can detect its presence, with a standard feed, (signal quality will of course be a function of dish size and system noise temperature) although it will be weaker (by 2 to 3 dB) than you could expect if you were utilizing a right hand circular feed mechanism. The September 1980 issue of **CSD** described an "under \$1.00 conversion" that could be made to any of the scalar loaded horns (i.e. Chaparral was used as an example) to temporarily turn such a feed into a right hand circular feed.

Late in June we put a SatFinder ten foot system into operation in the Turks and Caicos and the August issue of **CSD** contained a review of its performance here. Each time we walked by the small ten footer we eyeballed the "Saginaw Screw" motor drive system and wondered how far the arm might get us, to the east, if we dis-engaged the motor drive portion and simply relied on the hand crank. "Perhaps" we



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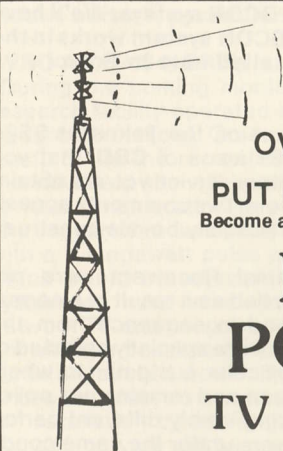


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mused "we might get as far as 30 degrees or so, and if we could, we might squeeze in the Intelsat feeds coming up for Argentina." One evening in mid-July we could take the thought of finding out just how far the dish would go east, no longer.

The four phillips head screws came out of the motor drive housing and the hand crank went into the slot. And off we went. Now the geometry of a Saginaw Jack Screw will fool you and we figured once we got to the end of the jack screw we would attempt to lift the dish on around to the eastern horizon. If worse came to worse, we would use some concrete blocks to elevate the dish a tad at a time until we ran into something in the eastern sky.

As the jack screw went out and the dish swung to the east, the pivot on which the jack screw turns gets almost straight up; and then the weight of the dish and the angle of the jack screw catches hold and the dish will flop (with a thud if you are not expecting it to happen; we were) to the eastern ground. In effect, the jack screw is lost to you and the dish is "free wheeling".

We had set our most sensitive of all, ICM TV 4200, receiver, on transponder 9 (Satcom "scale") expecting that when we passed through Ghorizont we'd see something there. Unfortunately, the Ghorizont position occurred at just the precise point where the jack screw pulled loose and we were free wheeling (how's that for dumb luck!). Back just a half turn, we were probably around 16 degrees east. Several concrete blocks and some two by fours later we had it moving up an 1/8th of an inch at a time.

Nothing. Out came the inclinometer and we set the dish carefully to our Ghorizont elevation heading; 21.5 degrees up. Still nothing. Although it looked like an increase in noise. So we tried tuning the receiver. There it was; on the transponder 7/8 position rather than 9/10. But hey...what is this? NTSC color???

Now the Russians do a lot of crazy things. Transmitting NTSC color is not one of them. Or so we thought. The program was a puppet show and we found audio on one of the odd-ball (7.4) sub-carriers (the 4200's six pre-set audio sub-carrier positions is very handy in a situation like this!). Noisy, but it was either Spanish or Portuguese.

We played with the antenna, and tried rotating the feed. The picture was slightly better just off of horizontal than it was in any other position. And in color. NTSC color at that. Now why would Russia be sending a puppet show in Spanish (we finally pinned the language down after getting the signal out of the noise) in NTSC color? That's American color!

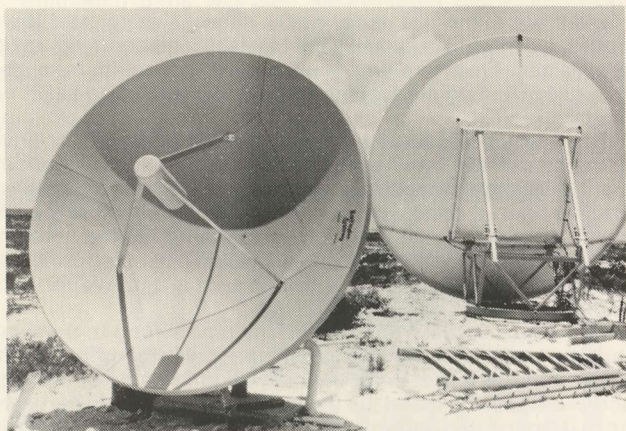
Well, to cut short the mystery it turns out that in the evenings, the Cubans are now using Ghorizont. From a Cuban uplink! Yes, friends, the Cubans now have their very own satellite channel through which they are transmitting a modified version of the Tele Rebelde (one of two Cuban terrestrial networks) programming. Now since Cuba has an excellent terrestrial microwave system linking all of their own TV transmitters together, why would they want to send their programs via bird? Humm.

In short order it all became clear. A 25 minutes newscast brought me up to date, in Spanish, on the latest happenings in the Caribbean. The newscast was in glorious black and white. The videotaped reports came from Belic(z)e, Guatemala, Grenada, and Europe. Most of them came from Habana however. And from Managua, Nicaragua.

Now if you are even politely interested in international politics, you will recall that not too far back Cuba was accused

of assisting the Sandinista regime in Nicaragua to take over the country. I wondered why there was so many news tapes shot in Nicaragua, until the end of the newscast. Then the wonderment turned to some astonishment. The announcer clearly explained, even to my non-Spanish speaking mind, that I was watching Cubana Television prepared and transmitted for Sandinista Television in Managua, Nicaragua. He went on to explain that this "satellite network" reached





**SATFINDER** tracks to Ghorizont. Ten footer was manually assisted to eastern sky and Ghorizont bird at 21 degree (east) look angle; larger AFC 5 meter on F1, at 17 degree look angle, behind it.

throughout Latin America. He never did explain (or mention) that it was being accomplished on a Russian satellite.

**So the Cubans are now operating an "international television network".** Via Ghorizont. There may not be a lot of "takers" for the service in the western hemisphere, but it does suggest some interesting political scenarios.

And this observation. Ghorizont continues to be used for some "interesting" (if unexplainable) side uses as well. United Press, under the UPITN banner, continues to feed daily DSS (Direct Satellite Service) news feeds to somebody, somewhere, via Ghorizont at 9 AM eastern. If finding Cuban NTSC color on Ghorizont doesn't shake your tree, finding UPITN accessing Ghorizont **directly from London** with a dozen of the top European news stories of the day, in English, might.

Ghorizont is viewable along virtually the full eastern USA seaboard. If I can see it with a ten foot dish, you can too. Oh yes...we are pleased to note that the SatFinder polar tracking mechanism is dead on, even in the Eastern sky.

## TECHNICAL CORRESPONDENCE AND NOTES

### HOT SUN?

A 2 inch square miracle box, huh? Private jets...off-shore James Bond types, eh? Wonder why they allowed Coop to peek inside, well knowing its simplicity and ease of duplication? Are you sure those "private jets" are not circular in shape and have weird running lights? Just **how hot** is the sun down on Provo, Bob?

Jim Beckett  
2215 Smith Road  
Horseheads, NY 14845

**By now the mystery is over since this appears in print after the Omaha showing of the SCDN system. We'll have more to say about how well the SCDN system works in the real world after we get one installed here in Provo!**

### WASHBURN RESPONSE

We were pleased, in your report on the Teknimat 692A receiver appearing in the July '81 issue of **CSD**, that you chose to comment on the satisfactory service you are obtaining from our Earth Terminal receivers. Two comments appearing in the Teknimat review could possibly be mis-construed however and require correction.

1) Your Washburn/Earth Terminal Receivers were not "hand picked". Each was supplied as a result of a normal production order, and shipped in sequence from the available units. No assemblies were specially selected or replaced because of the particular customer to whom they were destined. It has been and remains our policy that any customer experiencing visibly different performance from two of our receivers under the same conditions should return the lesser unit for service, as we do not expect such differences, nor excuse them as "normal" variations. If a company wishes to maintain a quality reputation this is the only sensible approach, as we never know which customers will compare our receiver to other brands. Therefore, any receiver shipped must represent our "best effort" or we run the risk of unfavorable comparison.

2) We do not accept the validity of color bar patterns as a measurement of "sharpness" of the picture delivered, as this merely compares the overall effect of the receiver under test plus the monitor in use. Note especially that broadcasters frequently employ a purposeful distortion known as "edge enhancement" to produce a better picture on the "average" television receiver; the results of this, on a good comb filter equipped monitor, look terrible. A similar effect can be obtained from a TVRO receiver with excessive video overshoot. We have in the past, and continue to, design our equipment for optimum transient response under EIA RS-250 test conditions, which assures that picture quality will improve, rather than degrade, when the user upgrades his TV receivers.

Clyde Washburn  
Earth Terminals, Inc.  
Fairport, NY 14550

**We never meant to suggest any of our three Washburn/Earth Terminal receivers were "hand picked" by the factory. Quite the contrary, we believe them to be representative of typical production units. It is for this reason that we noted in our July report on the Teknimat 692A that we have yet to find any single receiver (of any brand and model) which unequivocally produces the best looking pictures on any and all transponders. We hand selected which of our three Washburns we use on vertical transponders on F1, which we use on horizontal transponders on F1 and which we use on WTBS full time. We did this by careful comparison, using the same monitor in each case. By being slightly below threshold on virtually all transponders, on a 5 meter antenna, we can see slight receiver to receiver variations on given transponders. Our creed is to have the best receiver for that particular transponder in operation whenever we switch to that transponder for "air use". We have an older ICM 4200, for example, which we almost always use in antenna set up exercises simply because it is 1 to 3 dB better in very bottom end sensitivity than any other receiver available to us here. However, when we are at or near threshold with that same ICM receiver, the picture quality (i.e. resolution) suffers from bandwidth limiting. And so we don't use this particular receiver for WIV re-transmission purposes. Our color bar tests, with the Teknimat and the Washburns, carries over to programming as well. Teknimat video simply**



"looks better", particularly on saturated reds and blues.

#### TVRO AT 67.5 NORTH

During the coming months we will be relocating a radar research facility operated by SRI from Fairbanks, Alaska to Sondre Stromfjord, Greenland (latitude 67.5, longitude 52 west). Since the recreation/entertainment opportunities at this new field site will be almost non-existent, we are giving serious consideration to purchasing a TVRO earth station. The research radar operates on a frequency of 1300 MHz with a 4 megawatt pulse power, and utilizes a 90 foot dish which would be adjacent to the TVRO earth station. The system we have in mind should be capable of receiving network TV and programming from HBO, Showtime, and so on; with the possible ability to receive several transponders simultaneously. I would like to obtain the specifications and prices on major components and/or complete earth station for installation by our engineers and technicians. Any help you can provide will be greatly appreciated!

J. Loren Dye  
Engineering Assistant  
Radio Physics Laboratory  
SRI International  
333 Ravenswood Avenue  
Menlo Park, CA 94025

Westar 1 and 3 plus ANIK B; maybe. You certainly couldn't have a double conversion receiver with a high IF in the 1200-1300 MHz range with those 4 megawatt radar signals around! And whether your TVRO LNAs could stand that much signal nearby, even though 2400 MHz away, would require careful study. Anyone want to tackle this one? As far as we know, there is no experience with TVRO's in Greenland to draw upon. Loren's telephone number is (415)326-6200. If a site goes in and operates at Sondre Stromfjord, it will make a great story!

#### ROTATE YOUR SPHERICAL

It is possible to use a Spherical antenna to obtain signals from each of the birds in the domestic satellite belt. The antenna (reflector) is moved in the horizontal and vertical axis around its center and the feedhorn is placed in a **stationary** (focal) position, and **not moved**. The feedhorn is placed in the center of the satellite belt by either taking a magnetic heading between the antenna position and the feedhorn (and placing it at the proper degree position), or, by aligning the feedhorn and the antenna in such a way that the feedhorn is positioned directly in front of the antenna when the antenna is aimed at one of the satellites in the **center** of the belt. Depending upon your location, ANIK B is close for many observers.

The antenna reflector surface is then rotated about its center axis in both azimuth and elevation to reflect the signals into the feedhorn. A different reflector position is found for each satellite. We have found that approximately 30 degrees of reflector surface movement (azimuth) is required to cover the belt. From our Oregon location, with the feedhorn placed for the center of the belt in front of the antenna, the largest angular feedhorn variation from a direct line in front of the antenna surface is 15 degrees. This indicates we are within the +/- 22.5 degree aperture each side of boresight, which characterizes many of the Spherical antenna models available.

The mount should be constructed in such a way that the antenna surface will not warp out of circular trueness as the antenna is tilted and rotated. The central axis of the reflector for horizontal movement should be placed as close as possible to directly below the very center of the reflector surface. It is possible to hinge the reflector for elevation around an axis in line with the center of the antenna; the antenna frame will maintain the same distance to the feedhorn as the antenna is positioned for each satellite.

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Type N			
Chassis mt. sq. flange	\$3.25	Approx 3.25"x5.0"x.010	\$5.50
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MRF 911 FT5.0 GHZ	\$4.00	10, 18, 22, 27, 47, 100,	
BRF90 FT5.0GHZ	\$3.00	120, 180, 220, 270, 330,	
BRF91 FT5.0GHZ	\$3.50	390, 470, 560, 680, 820,	
NEC 02137 FT4.5GHZ	\$3.25	1K, 1.2K, 1.8K, 3.9K, 8.2K,	
NEC 02135 FT4.5GHZ		10K, 100K	\$6.00
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15DB @ 2.0GHZ	\$5.00		
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If the antenna is tilted about an axis on its **lower** end, there will be approximately 7 to 8 inches of movement of the reflector surface toward or away from the feedhorn. This movement, in our experience, does not seem to seriously degrade signals. In southern Oregon we have been able to obtain satisfactory results using a 12 foot reflector, this technique, and inexpensive electronics.

R. F. Kronner  
Sphero-Sat Antenna  
Roseburg, OR 97470

**You say it works; we believe you. But a 7 to 8 inch change in reflector to feedhorn distance sounds pretty serious to us.**

#### MORE PROOF / ESPN NAUGHTY

Evidently ESPN is no longer accepting money from private TVRO viewers. Recently, I sent a check for \$100 to ESPN requesting a letter of permission to view their programming via a TVRO. Their response, with my returned check, read as follows:

**"We are in receipt of your letter dated June 12, 1981 requesting permission to carry ESPN as a private user. I have been informed by our attorney that we are unable to grant such permission and therefore am returning your check for \$100. I have placed your letter in our file and should this situation change, I will contact you. Thank you for your interest in ESPN."**

This letter was signed by Mark E. Noon, Affiliate Marketing Representative. It is my understanding that ESPN formerly granted lifetime permission to view this service. I feel it is arbitrary and discriminatory to give permission to some private TVRO viewers and not others. Further, like others who live in remote areas, there is absolutely no chance of my receiving their services via a cable company. Therefore, I feel that their withholding their services from me is a bad case of discrimination.

W. Thomas Wolfe  
Red Hook, NY 12571

**ESPN originally granted lifetime subscriptions to their service for \$100. Then they went, for a brief time, to \$150. And finally they cut it out altogether. Their problem is with the cable firms that support them. Cable people have told ESPN that if they accept money from private viewers, they may lose the "bulk" viewers cable represents. Cable now brings in over 10,000,000 US homes for ESPN. They don't feel they can afford the risk of losing any of that "pie". None of which makes it "right"; but that IS the way it works these days.**

#### ANOTHER NEW ANTENNA

We have a new commercially produced antenna available. It has a 3.8 meter aperture and is of prime focus feed design. We also have a 4.9 meter antenna in production. The 3.8 meter has the following characteristics:

**Beamwidth/** 3.7 GHz 1.40° H plane, 1.40° E plane; 3.95 GHz 1.35° H plane, 1.35° E plane; 4.2 GHz 1.21° H plane, 1.21° E plane.

**Gain/** 3.7 GHz 41.7 dB; 3.95 GHz 42.2 dB; 4.2 GHz 43.0 dB.

These measurements were conducted on the antenna test range for Microwave Specialties in San Diego, California. Pricing and other information is available from us directly.

Rich Anderson  
Universal Satellite Systems  
Division of Doug's Inc.  
St. Hilaire, MN 56754

#### REUTERS ON 18

How can I interface the gobbly-gook found in TR 18, FI, to a Radio Shack personal computer? The purpose is **not** to infringe upon the proprietary rights to the Reuters service,

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but rather simply the challenge to see what all of those "bits" say.

John Ambry  
6448 W. Colonial  
Fresno, CA 93704

Reuter's gets around \$900 per month, we understand, for "use rights" to their "bits". If somebody out there has "broken the code", we would certainly publish a detailed report on what is involved. In the interest of science and education, of course.

### RESIN TRANSFER MOLDING

I was bitten by the STT bug about one year ago. My background is avionics and mechanical systems and I do contract engineering work for several aerospace firms (Boeing, Beech, Lear, Grumman). I have had my own TVRO in operation since last November, and after 8 months of evaluation and study, I am still learning. I can honestly say there is absolutely nothing like having a satellite receiver coupled to an Advent 6 foot projection system with stereo quad!

It would appear from SBOC '80 and SPTS '81 (DC) that fiberglass is, by far, the most popular choice for parabolic construction. I am, however, somewhat amazed at the lack of contour quality and structural integrity apparent in most of the antenna systems on display at seminars. All of the dishes were obviously fabricated using conventional chopped glass and/or cloth on an open mold. For those who might be interested, there is now a process known as resin transfer molding (RTM) for fiberglass parts of this nature. Similar to plastic injection molding, RTM employs both male and female tooling dies (closed mold) whereby a liquid fiberglass/resin compound is injected into the mold cavity. Using precise temperature and pressure controls, this process virtually eliminates the shrinkage and warping problems that are an inherent part of conventional open mold processes. It is true that RTM initial tooling costs are about 3 to 4 times greater than the cost of an open mold, but per part cost is significantly lower and the production rate per tool can be easily doubled. The bigger advantage is that a precise parabolic contour results, and you have an enhanced cosmetic appearance.

Richard E. Shogren  
2123 Lewis Street  
Salina, KN 67401

Most of the fiberglass antenna people keep their actual production techniques well guarded although we agree with you that the appearance of most gives away the fact that open mold techniques are still a fact of life. Nelson Ethier has done some testing with an approach similar to RTM and we understand at least one major supplier in the private terminal field, plus one of the commercial antenna firms, has recently switched to RTM. We seriously doubt most of the present open mold dishes will function well at 12 GHz, which is an important consideration with DBS service coming up sooner than most of us had expected.

### NEGATIVE PUBLICITY

Recently on local television there has been talk about a number of people being served with legal papers for civil suits because they are using home satellite tracking units. It was also said that the feds were about to make a move. What are your comments on all of this?

Joe Choctain  
Midland, TX 79701

To the best of our knowledge nobody is being prosecuted or charged at the moment by anyone else...for having, or using, a private, home satellite terminal. Non-authorized MDS and STV decoders are another story. We are aware that HBO, Showtime and several of the movie



companies have recently completed an investigation of several dozen motels, hotels, and apartment complexes spread across the country where satellite service featuring films from one or more of these groups are being distributed in rooms, without the contractual authorization of same. We expect a blockbuster law suit to be filed shortly against some motel, hotel or apartment group for having a TVRO which is receiving and "sharing" one or more of the "premium service" satellite channels. They beat this "rap" in Canada (see CSD for August) but we don't think they will here. To even have a chance to beat the charge, the motel, hotel or apartment owner will have to show conclusively that he did everything he could to negotiate for the service, including being willing to pay, but was ultimately turned down as a user by the premium service supplier. We suspect HBO et al will carefully select some installation which made no such effort since they don't want to end up in court having to defend their anti-competitive (i.e. discriminatory) trade practices. When the case hits, it will result in a lot more negative press. If you sell terminals, be prepared for this one.

#### DIRECT TO THE POINT

Yesterday I saw my first private home satellite receive terminal in operation, here in the Denver area. I was also given a copy of Bob Cooper's **Home Satellite TV Reception Handbook** to read. He is a master at making a very complex subject perfectly clear. Many of my fellow preachers are masters at making simple ideological things too deep to understand. Our congratulations to Coop!

Rev. John O. DeBoer  
Northglenn, CO 80233

We estimate more than 50,000 of that Handbook have now been printed and distributed. A new version will be out before the end of 1981 since this fast changing world stands still for no ink to dry!

#### TV IN BOTSWANA

We have in hand a copy of an article dated August 1979, written by Bob Cooper, for **Radio Electronics Magazine**. We are in the middle of the Kalahari desert and there is no television. The area is far too small to support a normal television system. Our nearest television broadcast system is in South Africa. We feel, from reading the article, that with a bit of effort and ingenuity that we could create a useful community service and that it would receive the blessing of the De Beers. Can you direct us to somebody who may be able to help us achieve our goal?

N. Edwards  
Instrument Technician  
Debswana  
Jwaneng Mine  
Private Bag 02  
Jwaneng, Botswana  
Africa

We feel sure that in our thousands of readers there are people/firms who have the experience and ability to assist you in bringing first time television to a remote section of Africa. Lend a helping hand fellows!

#### FCC DIDN'T DISCOVER MODULATOR

This is written with reference to your July 1981 CSD "Comments" regarding Microdyne Corporation's FCC application.

The TVRO submitted to the FCC utilizes a completely integrated electronic package that incorporates (at the feed) an LNA, receiver and TV modulator. The package mounts at the antenna with a single output on one of the (VHF channel) frequencies.

Since the integrated package included a TV modulator, Microdyne was advised both by its counsel and by an FCC

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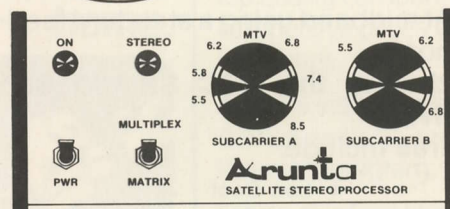
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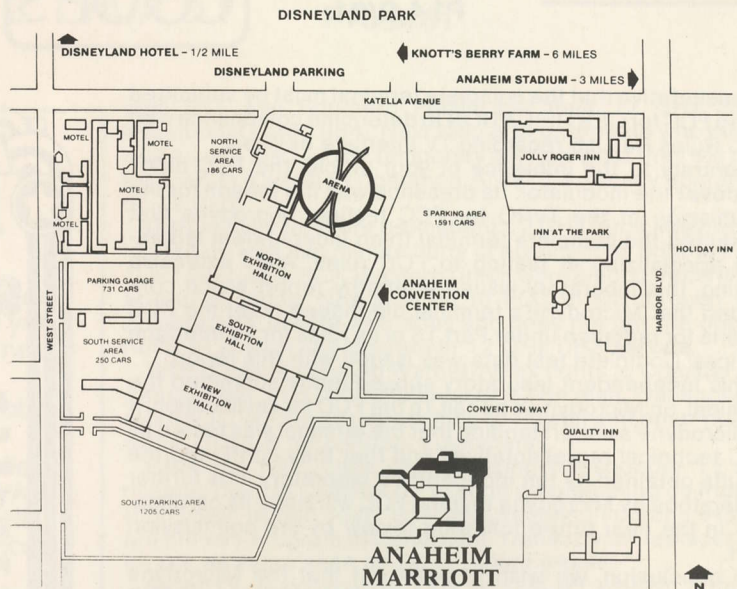
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**THE VIDEO STORE** of the future will "marry" the natural program selection ability of the satellite delivery system with the big screen advances which have paralleled the recent advances in home satellite terminal technology. **SVS '81 ANAHEIM** brings it all together in the most advanced, futuristic and receptive "video marketplace" in the world; Southern California! If you make, or sell retail video equipment of any type, this is **THE SHOW** for you!

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representative that the complete terminal must be submitted to the FCC for CERTIFICATION to determine compliance with FCC Rules Part 15 regarding TV interface devices.

Contrary to the inference of your article, the FCC didn't **discover** the modulator. Its presence was the reason for the submission of the TVRO for FCC testing. Microdyne first submitted the complete terminal to an independent laboratory specializing in testing to FCC rules. After extensive testing, this laboratory issued a lengthy report which concluded that Microdyne's terminal did indeed meet the FCC criteria for radiation under Part 15 of its rules for TV interface devices. Complete test data was issued with this report.

This independent laboratory subsequently submitted the terminal, on Microdyne's behalf, to the FCC for certification. It is Microdyne's understanding that the terminal was tested by FCC technical representatives and that they confirmed the results obtained by the independent laboratory. It is further understood by Microdyne that the FCC will issue its certification in the near future following review by the commission staff.

In conclusion, we wish to point out that the Microdyne application to the FCC was for CERTIFICATION, not TYPE ACCEPTANCE, and that the entire TVRO does pass muster. The source(s) for your article did not give you the actual facts, which could have been obtained by contacting us directly as you have done in the past.

L. H. Wolcott  
President  
Microdyne Corporation  
Ocala, FL 32672

We appreciate your clearing up the report for us. Our source was Rick Brown, VP and General Counsel for SPACE. He passed this along to us one day as an "example" of why SPACE needed his full time efforts in Washington. Without him watching what was happening at the FCC and in Congress, he said, the industry would be chaotic in no time at all. Apparently, this was one situation where his warnings were premature. Pity.

## BIRD OPERATIONAL NOTES

**CRACKING** the barrier. Hero Communications has sold four of its System 20H, full motorized 6 meter terminals with all aluminum wire mesh reflectors, new programmable polar mount control system, to four leading **TV stations** in this country; WPLG (Miami), WJXT (Jacksonville), WFSD (Hartford), and WDIV (Detroit).

**12 GHz** home service may be here much sooner than expected. SBS, the firm that now has one 12 GHz domestic bird in service (100 degrees west) and another scheduled for service at 97 west this fall, plans to allow up to six transponders for "interim DBS video service". SBS will take six transponders out of "inventory" from data, communication service channels, allow them to be rented on **interim basis**



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until GTE and Southern Pacific get their 12 GHz birds operational (late 1984). Next step is to determine who might wish to use the 12 GHz temporary service, what they will pay for it, when it will start operation. ANIK-B is already operating on 12 GHz.

**DBS** activity for more permanent 12 GHz birds meanwhile heated up with last minute flurry of applications prior to FCC July 16th cutoff. RCA, Western Union were among those filing at end of string. Now it is up to FCC to sift through the applications, decide who does and does not get the opportunity to launch and operate in 12 GHz DBS service.

**WOLD** has purchased Warner/Amex rights to Comstar D2 transponder 11H (11, horizontal or 22 on dial). Transponder reportedly will feed programming to Hawaii and other points within CONUS for contract customers.

**CBS** and **NBC** have been utilizing transponder 12 (24 channel dial) on Comstar D2 to send programming on Puerto Rico beam to San Juan. Specials, weekend sporting events are primary program material sent. Transponder replaces 23 on D3; no video seen on D3 in recent weeks.

**SelectTV**, successor to **VEU** service on Westar 1 transponder 5, now operating 8 PM eastern to 4:30 AM eastern weekdays, 2 PM eastern to 4:30 AM eastern weekends. Home Theater Network now operating 8 PM eastern to 2 AM eastern Westar 3, transponder 7.

**NATIONAL** Microtech may be first private terminal industry supplier to offer 12 GHz terminal gear; Gensat Communications (Canada) reports order for 5,000 12 GHz terminals from NMT.

**INTELSAT** is offering new fulltime TV service on either global, hemispheric or spot beam transponders; and, is studying ways to increase **INTELSAT** participation in sudden interest in national or domestic services.

**CBS** may have new technique for reducing unauthorized viewing by private terminals. On several Westar feeds uplink powers are simply "cranked back" to levels which take received signal levels on smaller dishes well down into noise. Large WU terminals taking feeds off of birds are sufficiently sensitive to still produce "network quality" pictures.

**SCRAMBLING** on recent fights may be counter productive. Firms contracting to provide reception terminal service at authorized reception points are delivered Oak descrambler in sealed and locked box, told not to open it until just prior to event. Only one descrambler is provided and instructions for connection overlook fact that video signal to feed descrambler must be without "clamping"; something most receivers cannot accomodate without "surgery". And if descrambler fails? Location goes without service, or in moment of desperation, uplink operator / programmer makes last second decision to kill scrambling rather than lose revenue at sites experiencing descrambler problems. All is not well, yet, in the scrambler world.

**AT LEAST** one major distributor of home hardware may be facing serious financial problems. Suppliers are pushing legal solutions to debts owed to them in excess of \$100,000 per supplier.

**FAILURE** of Space Services, Inc. 55 foot rocket to "get off the ground" from make shift pasture launch site in Texas apparently has not dampened enthusiasm of Texas and California backers for project. They will try again to create "low cost" satellite launch vehicle system.

**WESTINGHOUSE** finally received FCC OK for TelePromp-Ter merger. This makes Westinghouse largest entity in cable/broadcast/satellite communications field; including ownership of ten WESTAR 4 and 5 transponders when the new birds launch in 1982.

**SECOND** all night radio talk show launching September 1. "America Overnight" carried on discrete carrier on WESTAR 3, transponder 4. "Night Time America" previously went into service this past January on same bird, transponder 1.

**TAYLOR HOWARD** efforts in Australia (he spent two weeks there, again, late in July) bearing fruit. Five meter spherical



antennas, with 7 meter focal distance, now operational with Howard designed receivers at Ayers Rock, Mt. Isa, Moomba and Alice Springs. Feed of Australian Broadcasting Corporation (ABC) TV programs is via spot beam from INTELSAT. Australian DBS system now scheduled for 1985 start up date.

**LOWER PRICES** and some improved performance possible from Magnum Microwave Corporation double balanced mixers and VCOs. Alaskan Microwave, as distributor, now handling M43T mixer (inputs to 1300 MHz) with pricing in \$15 region, MC24T double balanced mixer (inputs to 4.2 GHz) with pricing in \$55 region; plus, V72T-1 VCO tuning 2.7 to 3.2 GHz and V82T VCO tuning 3.6 to 4.2 GHz, both with pricing in \$98 region. All prices for single quantity units.

**BEING PREPARED** for launch of new RCA F3R bird, how to track new bird into orbit position and being ready to do "hard number comparisons" between F3R and F1/F2 will be subject of extensive CSD report in forthcoming October issue.

**NET**, the Terry Easton uplink programming service first unveiled at SPTS '81 DC and discussed in the June issue of CSD, now scheduled for Spring '82 start on COMSTAR (of all places). NET will be joined there by single transponders each for ABC, CBS and NBC plus one for Robert Wold. ATT says "five is the limit" for their new "end to end" service. Which COMSTAR bird will be used remains unannounced.

**SPRING '82** launch also announced for "Weather Star", 22 hour per day service to feature mind boggling electronic coverage of national and international weather situation. Service is backed by Landmark Communications and ABC "Good Morning America" weather host John Coleman. Transponder 21 will be home for new service (F3R); Home Theater Network will continue to use two hours per evening for family movie features. Uplink will be from Atlanta.

**STEREO** music service, from ABC, using a pair of 15 kHz channels on WESTAR 3, TR 1, scheduled for 24 hour service in first quarter of 1982. A third 15 kHz audio channel on WESTAR 1, transponder 4, will handle new ABC daily talk show programming. One hitch - programming will probably be distributed in digital format.

**JERRY LEWIS** Muscular Dystrophy Labor Day telethon will be transmitted on Westar 3, TR 2 and on RCA F2 TR 5. Schedule starts at 9 PM eastern Sunday, September 6, runs through 6:30 PM eastern September 7th.

**SPACENET 1**, the Southern Pacific Communications satellite due to launch 1984 and be positioned at 119 west (where F2 now is) has sold out. A total of 24 video transponders went to the likes of Pop Network (5 transponders), SSS (3), Double B Enterprises (1) Landmark Communications (2), Southern Baptist Convention (2) and so on. Spacenet 1 had originally been earmarked for narrow band, **non-video** services. This makes an additional 24 "on the horizon".

**FCC** meanwhile nervous, undecided, what to do about satellite operators who are offering "for sale" transponders, rather than rent/lease. FCC rules are confusing and Hughes, Westar are taking advantage of confusion to try the sale approach rather than lease approach. There are tax advantages both ways; sale allows depreciation, lease allows operating write off, for buyer.

**RCA** wants to "push" the North American domestic belt further east; asking for 66 degrees west for 1983 launch of SATCOM 66 (numbers for location; a "keen" idea). FCC must act on this. Present US limit, based upon international understandings, is 70 west.

**HEALTH CHANNEL**, pushed by NBC Health expert Dr. Art Ulene, now set for April 1982 start up as 24 hour service. Exact bird it will start on not yet known.

**LATEST** twist to pushing DBS; one applicant likens it to "clear channel AM radio service", those handful of 50,000 watt AM band stations that have national use of a single frequency for rural coverage.

**REPORTS** tell us that a 4 foot prototype terminal has succeeded in picking up SBS test 12 GHz DBS trans-

missions. Firm offering dishes is Orrox, plans shipments early in 1982.

**SIN** (Spanish International Network) will live up to its name starting October 11th when 7 hour special, via WESTAR 3 and Intelsat, will be aired in US, Mexico, throughout central and South America as well as Spain. A total of 35 million TV homes will be connected together on three continents starting at 12 noon eastern.

**RCA has cleared data and narrow band communications off of vertical transponders 15 and 19 on F1; this now means every transponder but 4 (broken) has video on it; the world's first 23 channel satellite (!).**

**ABC** has chosen a \$10,000 S-A terminal for each of its 1,700 radio affiliates. Service will handle up to 20 15 kHz wide digitally processed stereo audio channels on a single transponder.

**RCA** won the award for three new K band (12 GHz) satellites for GStar, the GTE satellite system due to become operational at 106 and 103 west in 1984.

**TED TURNER** was right when he accused Westinghouse of planning a competitive all news service. ABC and Westinghouse plan 24 hours per day, for cable TV, all news service. This service will use five (you read right) transponders on Westar 4; one for national feed to cable TV (outward bound line), 3 will feed out "regional" coverage for special areas of the country, fifth will be used for inward bound raw footage. Feeds will come from 24 ABC affiliates spread throughout USA.

**START UP** of Satellite Music Network, to use sub-carriers on WGN's TR 3, F1, delayed to September 1st. There will be three audio services when it cranks up; 24 hour per day country, pop-adult and "beautiful music".

**ANOTHER** audio only service, TRANSTAR, will debut for 24 hours per day service on TR1, Westar 1, October 15. This one is aiming at audio market made up of people between 25 and 34 years of age.

**INSIDE** reports indicate Heath (kit) satellite TV receiver project should require up to 30 hours of final assembly time for a single person, plus, 3 people 1 day to put in foundation and dish.

**IF** you think you have discovered bonanza by catching parts of yet-to-be released movies on Westar 1, stay in your seat. Paramount is merely sending out "clips" and "trailers" to movie theaters via satellite now. Full features are **NOT** being sent via satellite, prior to theater release.

**GRAND** Old Opry about to test new S-A 10 meter uplink; will feed program of same name, and others from country music capitol, direct to TV stations and cable TV systems nationwide starting any day now.

**DEALERS** attending Omaha SPTS reported problems with firm called Signals of Tuscon/Skyscan Corp. Alleged is that firm owners backed van up to facility, cleaned it out, leaving behind potentially hundreds of thousands of dollars in unfilled orders from dealers nationwide. If you are affected, contact Les Turner, Pima County Consumer Protection Agency or M. H. Kingery, Postal Inspector, P. O. Box 26070, Tucson, AZ 85726. Backers of operation had also attempted to start something they called S.A.R.A. (Satellite Antenna Retailers Association). As always, be very cautious of "good deals" from new firms with no established track records. The rapid growth of this business will continue to attract fly-by-night operators.

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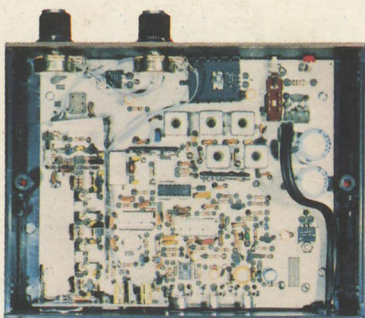
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Frequency range:	3.6-4.3 GHZ tunable
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Threshold:	8db CNR
IF bandwidth:	30 MHz for full fidelity video
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Outputs:	Standard one volt audio and video, compatible with VCRs, monitors and modulators
Optional:	BC-1 RF modulator kit, tunable channels 3-6 with sound



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